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IVAN M. JOHNSTON

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1. TRIGONOTIS IN SOUTHWESTERN CHINA

THE GENUS *Trigonotis* has its greatest concentration of species and its most important center of endemism in the mountainous country of southwestern China. The present paper represents the first attempt to classify and distinguish the numerous species of the genus in that area. It is concerned with those known from Hupeh, Szechuan, Yunnan, Kweichow and Kwangsi. For its preparation I have studied the specimens of the genus preserved at the Gray Herbarium (G), the New York Botanical Garden (NY) and the Royal Botanic Garden at Edinburgh (Edinb). I have also had available for this study some critical notes on the Indian species which I made several years ago at Kew.

With the exception of one widely distributed weedy species, *T. peduncularis*, the species of *Trigonotis* in southern China are all evidently distinct from those in the region to the northward. For my work this has been fortunate for I have escaped becoming involved in the problems of classification still enveloping these northern congeners. The northern species are in great need of revision. They are so poorly understood that a number of them, even recently, have been described under the genus *Omphalodes*. The most useful work on the northern species is contained in the synopsis of the Korean and Japanese species by Nakai, Tokyo Bot. Mag. 31: 215-218 (1917) and in the critical

notes and bibliography given by Herder, Act. Hort. Petrop. 1: 543-564 (1872).

During the study for the present paper several details concerning the morphology of the nutlets in *Trigonotis* have become clear. All the species of *Trigonotis* do not have tetrahedral nutlets. In such species as *T. heliotropifolia*, *T. Rockii* and *T. delicatula* the nutlets are bifacial and generally similar in gross aspect to those found in the genus *Myosotis*, having a rounded back and an obtusely angled adaxial face. A consideration of the nutlets in *T. Mairei* and *T. Rockii* has suggested how the tetrahedral form has been developed in other species of the genus. The inferior face of the truly tetrahedral nutlets is morphologically equivalent to the lower half or third of the dorsal face in the bifacial nutlets such as found in *T. heliotropifolia*, *T. delicatula* and *T. Mairei*. The dorsal face of the truly tetrahedral nutlets has been set off from the lower face by the formation of a medio-transverse angle across the back of an erect bifacial nutlet. The acute inner angle of the tetrahedral nutlets, that nearest to and paralleling the style, is the homologue of the obtuse medio-longitudinal angle on the ventral side of bifacial nutlets. The small attachment of nutlets in *Trigonotis* is therefore at the basal end of the ventral keel. It is not lateral nor is it at the broad base of the nutlet-body as it is in *Cryptantha* or *Lithospermum*.

KEY TO THE SPECIES

- Nutlets dark, with a pallid tumid cartilaginous margin on at least two edges of the dorsal face, faces usually muriculate; inflorescence bractless.
 - Nutlets tetrahedral, the three inner faces evidently developed and subequal, the dorsal surface nearly plane. . . 1. *T. macrophylla*.
 - Nutlets not tetrahedral, elongate, bifacial, the dorsal surface convex, rounded upward in a curve sweeping from the nutlet-attachment to the nutlet-apex, the ventral side broadly and very obtusely angled.
 - Leaves broadly elliptic or lanceolate, 2.5-5 cm. broad, sparsely strigose; corolla 4-5 mm. broad; inflorescence conspicuously pedunculate . . . 2. *T. Mairei*.
 - Leaves lanceolate, 1-2 cm. broad, densely strigose; corolla 2.5 mm. broad; inflorescence short-pedunculate . . . 3. *T. compressa*.
- Nutlets with margins acute or rounded or winged, not tumid nor cartilaginous, faces not muriculate.
 - Nutlets (exclusive of the winged margin when present) tetrahedral, the 4 faces evident.
 - Margin of nutlet conspicuously winged and incurving; nutlets hispidulous; leaves cordate . . . 4. *T. moupinensis*.
 - Margin of nutlets rounded, angulate or very narrowly winged.
 - Inflorescence naked, entirely devoid of bracts, racemes frequently geminate on naked peduncles.

- Nutlets with acute edges, pale; calyx-lobes oblong to linear, evidently surpassing the calyx-tube which does not embrace the nutlets at maturity. . . 5. *T. omeiensis*.
- Nutlets with rounded edges, black; calyx-lobes broad and rounded, scarcely if at all longer than the calyx-tube, the latter embracing the nutlets at maturity.
- Plant with a simple raceme; pedicels becoming only 1-2 mm. long; leaves small, 2-3 cm. long, numerous, strigose below . . . 6. *T. brevipes*.
- Plant with dichotomous racemes; pedicels becoming 2-5(-8) cm. long; leaves large, few, usually with coarse spreading hairs beneath . . . 7. *T. Cavaleriei*.
- Inflorescence bearing bracts between at least the lower flowers.
- Nutlets not stipitate or if stipitate the stipe not decurved.
- Plant villous, with spreading hairs; stems very slender, trailing, leaf-blades suborbicular . . . 8. *T. mollis*.
- Plant strigose; stems erect or decumbent.
- Plant 10-18 cm. tall; leaves mostly basal, blades orbicular to reniform, apex rounded or even retuse, veinless; corolla 6-7 mm. broad; nutlets with the lower ventral face smaller than the two upper faces . . . 9. *T. rotundata*.
- Plant 20-60 cm. tall; leaves mostly cauline, blades ovate to elliptic or lanceolate, evidently veined on lower face, apex obtuse to acute; corolla 2.5-5 mm. broad; nutlets with 3 ventral faces subequal . . . 10. *T. microcarpa*.
- Nutlets stipitate with the evident stipe abruptly bent to one side.
- Plant annual; corolla inconspicuous, 1-2 mm. broad. . . 11. *T. peduncularis*.
- Plant perennial, caespitose; corolla 4-5 mm. broad.
- Stems and leaves cinereous, densely slender-strigose. . . 12. *T. vestita*.
- Stems and leaves green, sparsely short-strigose. . . 13. *T. gracilipes*.
- Nutlets not tétrahedral, bifacial, back flat or merely rounded off towards the attachment, obtusely angled on the ventral side, nutlet-attachment nearly basal.
- Plant 2-7 dm. tall; corolla evidently strigose outside. . . 14. *T. heliotropifolia*.
- Plant less than 2 dm. tall; corolla glabrous outside.
- Inflorescence bracteate throughout; pedicels slender, recurving or contorted; stems slender, elongate, prostrate; plant apparently perennial . . . 15. *T. delicatula*.
- Inflorescence bracted only at the base; pedicels stiffly ascending; stems erect; plant a caespitose perennial. . . 16. *T. Rockii*.

1. *Trigonotis macrophylla* Vaniot, Monde des Plantes, sér. 2, 7: 42 (1905); Fedde, Repert. 2: 157 (1906). *T. pedunculata* var. *macrophylla* (Vaniot) Léveillé, Fl. Kouy-Tchéou 55 (1914).

KWEICHOW: vicinity of Kouy-yang, margin of mountain stream, July 20, 1893, *Emile Bodinier 2426* (TYPE, Edinb.).

In the type-collection the faces of the nutlets are smooth and glabrous. The following variants agree with the type in general habit of growth and in the size and shape of the nutlets, but differ in having the nutlet-surfaces characteristically roughened.

1a. *Trigonotis macrophylla* var. *trichocarpa* Handel-Mazzetti, Sinensia 5: 18 (1934).

KWEICHOW: Tungtse, Lou-shan, May 27, 1930, *Tsiang 5147* (ISOTYPE, NY); Liang Feng Yah, Tsunyi Hsien, 1150 m., Aug. 12, 1931, *Steward, Chiao & Cheo 303* (NY).

Faces of the nutlets bearing scattered spicular trichomes.

1b. *Trigonotis macrophylla* var. *verrucosa*, var. nov.

A varietate genuina differt facie nuculae verrucosa.

KWANGSI: Chy Fang Shan, 30 li southwest of Shan Fang, N. Lucheng, 1020 m., common in woods, fl. purplish, June 9, 1928, *R. C. Ching 5888* (TYPE, NY). TONKIN: near Chapa, bank of road in damp forest, July 1930, *A. Petelot 4192* (NY).

2. *Trigonotis Mairei* (Lévl.), comb. nov. *Omphalodes Mairei* Léveillé in Fedde, Repert. 12: 188 (1913). *T. muriculata* Johnston, Candollea 4: 309 (1931).

SZECHUAN: Ma-pien Hsien, 1300 m., herb in waste ground, May 10, 1931, *Wang 22839* (G). YUNNAN: Lungkai, in moist woods, 700 m., perennial, evergreen, fl. blue-violet, *Maire* (TYPE, *O. Mairei*, Edinb.; TYPE, *T. muriculata*, Geneva; ISOTYPES G); mountains of Ku-long-tchang, tufted perennial, fl. white, 800 m., *Maire* (G); sine loc., *Ducloux 98* (NY).

Trigonotis Mairei and *T. muriculata* were described from duplicates of the same collection and are clearly synonymous. The nutlets of the species are similar to those of *T. compressa* but are thicker with the inner face more prominently angled. The dorsal side is convex and margined and below rounded off in a sweeping curve towards the nutlet-attachment. There is, hence, no definite basal face to the nutlet.

3. *Trigonotis compressa*, sp. nov., herbacea foliosa ascenderet graciliterque ramosa 3 dm. alta; caulibus erectis sparse strigosis; foliis lanceolatis 5-7.5 cm. longis, 1.5-2.5 cm. latis, infra medium apicem

versus gradatim attenuatis, basi obtusis vel rotundis; petiolis 0.5–3 cm. longis; racemis gracilibus ebracteatis simplicibus vel geminatis 1–3 cm. longe pedunculatis; pedicellis floriferis 1–2 mm. longis, fructiferis 3–6 mm. longis ascendentibus; calyce florifero 1–2 mm. longo, fructifero 2.5 mm. longo, lobis lanceolatis 1.5 mm. longis ascendentibus; corolla “purpurea,” tubo 1 mm. longo, limbo ca. 2.5 mm. diametro; nuculis ca. 1 mm. longis erectis compressis bifacialibus nigris papillatis vel muriculatis, facie dorsali majore ovatis convexis, faciebus ventralibus obtuse angulatis.

SZECHUAN: Nanchuan Hsien, roadside, 1800–2100 m., one ft. tall, fl. purple, *Fang 1111* (TYPE, Gray Herb.; ISOTYPE, Edinb.).

Evidently related to *T. Mairei* but differing in its narrower more abundantly strigose leaves, smaller corollas, much less evidently pedunculate inflorescence, and more compressed nutlets. The nutlets are compressed perpendicularly to the floral axis and are practically bifacial. The apparent base of the nutlet (i.e. the part inferior and exterior to the point of attachment) is obscurely flattened. This narrow ill-defined basal surface is homologous to the basal face in the perfectly tetrahedral nutlets of other species. In *T. compressa* it is ill-defined and very much smaller than the other faces of the nutlet. The inner side of the nutlet is obtusely angled or in other words slopes gently towards the lateral margins from either side of the medio-longitudinal line. The two planes thus formed, which are very similar to those observable in other borages, for example in *Myosotis*, are homologous to those faces in tetrahedral nutlets which are nearest the style.

4. *Trigonotis moupinensis* (Franch.), comb. nov. *Omphalodes moupinensis* Franchet, Nouv. Arch. Mus. Paris, sér. 2, 10: 64 (1887) and Pl. David. 2: 102 (1888). *O. cordata* Hemsley, Jour. Linn. Soc. Bot. 26: 148 (1890).

HUPEH: *Henry 4029* (Edinb.), 5329 (G); *Wilson 241* (Edinb.).

According to Franchet the type was collected by David in “Moupin, in silvis passim. Fl. April, 1869.” Hemsley based his synonymous species upon collections from Patung, Hupeh (*Henry 1445, 4029* and *5412*) and South Wushan, Szechuan (*Henry 5610*).

The species is remarkable for the excessive development of the margin about the dorsal face of the nutlet. This thin upturned winged margin gives the nutlets a superficial resemblance to those of the European species of *Omphalodes*. Though this resemblance is striking enough to have misled Franchet and Hemsley, and recently even Brand, the present species is certainly not a member of the genus *Omphalodes*. The

body of the nutlet in the species is distinctly of the tetrahedral type and very similar to that of other species of *Trigonotis*. Of greatest importance is the nature and position of the nutlet-attachment. *Omphalodes* belongs to the Cynoglosseae and in agreement with the other genera of that tribe has the nutlet-attachment places supramedially or subapically on the rounded venter of the nutlet. This is certainly not the condition in the present species.

The nutlets in *T. moupinensis* are blackish and hairy. The outer surface of the upturned margin is pale and somewhat rugose. The species is related to the Indian *T. ovalifolia* (Wall.) Benth. which has black hispidulous nutlets with a narrow wing.

5. *Trigonotis omeiensis* Matsuda, Tokyo Bot. Mag. **33**: 148 (1919).

SZECHUAN: Mt. Omei, herb about thickets, 950 m., fl. bluish, Wang 23129 (G); Nanchuan Hsien, roadside, 1500–2700 m., 1928, Fang 915, 1159 and 1348 (G, Edinb.). KWANGSI: Nan Kan, Lin Yuin Hsien, 1360 m., 1933, Steward & Cheo 184 (G, NY); sine loc., Faber 598 (NY).

The species was described from collections made on the slopes of Mt. Omei by I. Yamazuta. I have seen no authentic material of this species. The original description, however, applies very clearly to the well-marked species treated here.

6. *Trigonotis brevipes* Maximowicz, Bull. Acad. St. Pétersb. **27**: 506 (1881); Nakai, Tokyo Bot. Mag. **31**: 215 (1917). *Eritrichium brevipes* Maxim. Bull. Acad. Sci. St. Pétersb. **17**: 446; Mém. Biol. **8**: 547 (1872).

HUNAN: near Changsha, along the Linyang-ho, 350 m., in thickets, April 1915, Handel-Mazzetti 11687 (G).

The above cited collection does not have mature fruit. As far as comparisons can be made with half mature nutlets, however, the collection does seem to agree with *T. brevipes*, a species known otherwise only from Japan.

7. *Trigonotis Cavaleriei* (Lévl.) Handel-Mazzetti, Symb. Sin. **7**: 819 (1936). *Omphalodes Cavaleriei* Léveillé in Fedde, Repert. **12**: 188 (1913). *O. Esquirolii* Léveillé in Fedde, Repert. **12**: 188 (1913) and Cat. Seu-Tchouen, tab. 6 (1918). *O. Vaniotii* Léveillé in Fedde Repert. **12**: 188 (1933). *T. Faberi* Handel-Mazzetti, Anzeiger Akad. Wiss. Wien **61**: 165 (1924), and Symb. Sin. **7**: 819 (1935).

KWEICHOW: margin of streams, Pin-fa, April 13, 1902, *Cavaleriei* 411 (Edinb., TYPE of *O. Cavaleriei*) and 806 (Edinb.); Tang-Tchang (Hoang-Tiao-Pa), June 21, 1909, *Esquirol* 1559 (Edinb., TYPE of *O.*

Esquirolii); without locality, moist places, May 1905, *Esquirol* 454 (Edinb., TYPE of *O. Vaniotii*); without locality, *Cavalerie* 4272 (G). YUNNAN: Yung-shan Hsien, 2300 m., moist shaded soil, fl. sky-blue with yellow eye, June 22, 1932, *Tsai* 51103 (G). SZECHUAN: Kuan Hsien, 900–1200 m., July 1928, *Fang* 2224, 2356 and 2380 (G, Edinb.); Mt. Omei, 1000 m., July 1931, *Wang* 23165 (G); "Mt. Omei, 1600 m.," *Faber* 671 (NY, ISOTYPE of *T. Faberi*); O-pien Hsien, 1800 m., May 1932, *Yü* 797 (G).

A well-marked species with a distinctive habit. The broad leaves are usually subcoriaceous and along with the stems usually more or less shaggy with slender brown hairs. The numerous stiff naked racemes are projected from the leafy mass of the plant on a well-developed peduncle.

8. *Trigonotis mollis* Hemsley, Jour. Linn. Soc. Bot. 26: 153 (1890).

HUPEH: Fang Hsien, under rocks, 900–1200 m., May 1907, *Wilson* 3393 (G); Ichang, *Henry* 1574 (G); without locality, *Henry* 6735 (G, NY).

Hemsley describes this species as based upon collections from "Hupeh: Ichang, Fang, and Changyang (*A. Henry*, 630A, 1574, 6735, 7796!)."

9. *Trigonotis rotundata*, sp. nov., perennis; caulibus strigosis erectis 10–18 cm. altis e caudice procumbente gracili laxe ramoso foliis dessicatis persistentibus vestito orientibus; foliis inferioribus maxime conspicuis, lamina orbiculari vel subreniformi 6–17 mm. lata, apice rotunda vel subretusa saepe apiculata, basi rotunda vel reniformi, petiolo lamina 1–2-plo longiori gracili conspicuo; foliis mediis et superioribus caulis sparsis abrupte reductis sessilibus vel breviter petiolatis; inflorescentia terminali solitaria basim versus sparse bracteata maturitate distantiflora; calycibus ad anthesim ca. 2 mm. longis strigosis 1–2 mm. longe pedicellatis; calycibus fructiferis 3 mm. longis, lobis ascendentibus lanceolatis ca. 2 mm. longis, pedicellis 5–10 mm. longis gracilibus ascendentibus; corolla 5–7 mm. diametro coerulea; nuculis 1 mm. longis et latis angulatis sessilibus depresso tetrahedraeis faciebus interioribus minoribus.

YUNNAN: Likiang, *Handel-Mazzetti* 3725 (G); Goodu Shan, 3300 m., *Forrest* 20519 (TYPE, Edinb.); Litang River divide, 4200 m., *Ward* 4016 (G, Edinb.).

This species of southwestern China has been confused with *T. rotundifolia* of the Indian Himalayas. That plant, however, has ebracteate geminate racemes and a distinctly tetrahedral nutlet similar to that found in *T. microcarpa*.

10. *Trigonotis microcarpa* (Wall.) Bentham ex Clarke, Fl. Brit.

India 4:172 (1883). *Myosotis microcarpa* Wallich, Numerical List 928 (1828). *Eritrichium microcarpum* (Wall.) De Candolle, Prodr. 10:123 (1846). *T. peduncularis* var. *microcarpa* (Wall.) Brand, Pflanzenr. [Heft 97] IV, 252²:198 (1931).

YUNNAN: Likiang, *Schneider* 3372 (G); Ping-pien Hsien, *Tsai* 55439, 55458, 60176, 60209, 60641, 60751, 62037, and 62368 (G); Shang-pa Hsien, *Tsai* 54717 (G); Kien Shuei Hsien, *Tsai* 53340 (G); Yengyueh, *Forrest* 24810 (G, Edinb.); Yunnan-sen, *Maire* 2244 (G, Edinb.); Mengtse, *Henry* 9354 and 9755a (NY); northwestern Yunnan, *Handel-Mazzetti* 9598 (G).

The type of this species was collected by Wallich in Nepal. It agrees closely with the Chinese specimens I have cited above.

11. *Trigonotis peduncularis* (Trev.) Benth. ex Baker & Moore, Jour. Linn. Soc. Bot. 17:384 (1879), nomen; Hemsley, Jour. Linn. Soc. Bot. 26:153 (1890); Nakai, Tokyo Bot. Mag. 31:216 (1917). *Myosotis peduncularis* Treviranus, Mag. Ges. Naturforsch. Freunde Berlin 7:147, tab. 2, fig. 6-9 (1816). *Eritrichium pedunculare* (Trev.) DeCandolle, Prodr. 10:128 (1846); Ledebour, Fl. Ross. 3:153 (1846-51); Herder, Act. Hort. Petrop. 1:543 (1872), excl. pl. himalay.

A weedy annual with inconspicuous corollas, which is widely distributed in eastern and southern China. The nutlets vary from glabrous to hispid. In some forms one nutlet (apparently the adaxial) is glabrous and the remaining three are hispid. The calyx-tube and adjacent portion of the pedicel tend to become rather characteristically thickened at maturity. The species is established upon collections made by F. Blume in damp ground near Astrakhan between 1810 and 1812. Treviranus, in publishing it, gave a good description and several figures, of fruit, corolla and calyx, all evidently applicable to this common weedy species of China. The species, consequently, ranges from the Caspian region across central Asia to Amur and then southward into China and Japan. I have seen no specimens from India.

12. *Trigonotis vestita* (Hemsley) Johnston, Contr. Gray Herb. 75:47 (1925). *Trigonotis pedunculata* var. *vestita* Hemsley, Jour. Linn. Soc. Bot. 26:154 (1890).

YUNNAN: Ta Ho Shan, western Likiang, Snow Range, 3900 m., *Rock* 4237 (G). SZECHUAN: North Wushan, *Henry* 7072 (G, isotype); Muli, 2700 m., *Ward* 4588 (G, Edinb.); Muli, *Handel-Mazzetti* 7379 (G); Muli, 3000 m., *Ward* 4499 (G, Edinb.).

This species differs from *T. pedunculata* in habit, indument, calyx, and corolla. In fruit, however, it is very similar to that species.

13. **Trigonotis gracilipes**, sp. nov., caespitosa: caulibus gracilibus erectis vel decumbentibus 1–4 dm. altis simplicibus vel (saepissimae infra medium) sparse graciliterque ramosis strigosis; foliis numerosis utrinque strigosis, lamina elliptica vel oblongo-lanceolata saepe 1–3 (–4) cm. longa 5–13 (–20) mm. lata, inferioribus 2–4 cm. longe petiolatis, superioribus gradatim reductis subsessilibus; floribus extra-axillaribus solitariis secus (non rariter apicem usque ad basim) caulibus inter foliis dispositis, non rariter summum ad apicem caulis in racemum ebracteatum aggregatis; pedicellis gracilibus floriferis 1–5 mm. longis, fructiferis 5–25 mm. longis ascendentibus rectis vel flexuosis; calycibus ad anthesim 1–1.5 mm. longis strigosis, fructiferis 2–3 mm. longis, lobis ovatis acutis 1.5–2 mm. longis; corolla 4–5 mm. diametro; nuculis ca. 1 mm. longis tetrahedraeis angulatis non rariter sparse pubescentibus pallidis pedicellatis, pedicello deflexo.

SZETCHUAN: Muli range, 4200 m., *Ward 5228* (G); northeast of Kulu, Muli, 4460 m., *Rock 17867* (TYPE, Gray Herb.; ISOTYPES, NY, Edinb.). YUNNAN: Mekong-Salwin divide, lat. 28° 20', 2700 m., *Forrest 14168* (Edinb.); northwest Yunnan, *Mombeig 197* (G, Edinb.); east flank of Likiang range, lat. 27° 20', 3300–3600 m., *Forrest 5783* (Edinb.); no locality given, *Tsai 57484* and *57614* (G); northern Yunnan and eastern Tibet, 3000 m., *Ward 665* and *418* (Edinb.); northern Yunnan and eastern Tibet, 3900 m., *Ward 636* (Edinb.). INDIA: Pheonp, eastern Himalaya, 4050 m., 1913, *Ribu & Rhomoo 6372* (Edinb.); Jongri, 4200 m., 1913, *Ribu & Rhomoo 6555* and *Lepcha 942* (Edinb.).

This species has been confused with *T. ovalifolia* of the Indian Himalayas, which has bractless inflorescences. One of the peculiarities of *T. gracilipes* is the occurrence of long-pedicellate flowers among the leaves on the middle and lower portions of the stem. The only other Chinese species that shows this development is *T. delicatula*.

14. **Trigonotis heliotropifolia** Handel-Mazzetti, Anzeiger Akad. Wiss. Wien 61:165 (1924) and Symb. Sin. 7:818 (1936).

SZETCHUAN: Muli, lat. 28° 12', 3000 m., *Forrest 16807* (Edinb.); southeast of Muli, lat. 27° 50', 3300 m., *Forrest 22468* (Edinb.). YUNNAN: Yungpeh, 2675 m., *Handel-Mazzetti 3344* (Edinb., ISOTYPE); mountains between Yungpeh and Yungning, lat. 27° 20', 3000–3300 m., *Forrest 22054* (Edinb., NY).

A very well marked species that might be passed as a coarse form of *T. microcarpa*. It is, however, abundantly distinct from that species in fruit and flowers. By having the large corollas evidently strigose outside it is easily and quickly distinguished from all other Chinese members of the genus.

15. **Trigonotis delicatula** Handel-Mazzetti, Anzeiger Akad. Wiss. Wien **62**: 26 (1925, Feb.). *T. contortipes* Johnston, Contr. Gray Herb. **75**: 46 (1925, Sept.).

YUNNAN: east slope Likiang range, 3300–4000 m., *Forrest* 2619 (Edinb.), and 5954 (Edinb.), *Rock* 9449 (G) and 10637 (G, TYPE of *T. contortipes*; Edinb.); district of Likiang, 3900–4800 m., *Rock* 4817 and 6069 (G); Likiang, 3000–3900 m., *Schneider* 1800 and 1921 (G), *Forrest* 2304 (Edinb.), *Handel-Mazzetti* 3724 (G). SZECHUAN: Tschescha pass, south of Muli, 4100 m., *Handel-Mazzetti* 7253 (G, Edinb., ISOTYPES of *T. delicatula*).

A well-marked species. It has slender elongate subsimple prostrate stems and usually characteristically contorted slender pedicels.

16. **Trigonotis Rockii** Johnston, Contr. Gray Herb. **75**: 47 (1925).

YUNNAN: Likiang, 3300–3600 m., *Schneider* 3624 and 3868 (G), *Rock* 5256 (G, TYPE; ISOTYPES Edinb., NY); Likiang range, 3300–3600 m., lat. 27° 35', *Forrest* 10144 (Edinb., NY); east flank of Likiang range, 3300–3600 m., *Forrest* 6301 (Edinb.). BURMA: west fork of N'Maikla-Salwin divide, lat. 26° 30', long. 98° 48', 3600 m., *Forrest* 26918 (G, Edinb.).

Although having nutlets that are very similar to those in *T. delicatula* this species differs widely from that species in almost all other structures. In gross habit *T. Rockii* most closely approaches *T. rotundata*.

EXCLUDED SPECIES

Trigonotis Bodinieri (Lévl.) Léveillé, Fl. Kouy-Tchéou 55 (1914). *Omphalodes Bodinieri* Léveillé in Fedde, Repert. **12**: 188 (1913).

This is not a borage but a member of the Loganiaceae. The type specimen at Edinburgh, Cavalerie 6^{bis}, from Pin-fa, Kweichow, has been identified by Handel-Mazzetti as *Mitreola pedicellata* Benth.

2. NOVELTIES AND CRITICAL NOTES

Cordia cordiformis, sp. nov., arborescens 6 m. alta rufo vel fulvo indumento vestita; ramulis (et petiolis) pilis gracilibus 1–2 mm. longis hirsutis; foliis cordatis 4–15 cm. longis et latis homomorphis, apice obtusis abrupte breviterque acuminatis, basi cordatis vel rotundis in petiolum 1–4 cm. longum abrupte attenuatis, margine denticulatis, supra strigosis vel appresse minuteque hirsutulis, subtus pallidis in nervulis ramosis numerosis pilis gracilibus flexuosis 0.5–1 mm. longis appressis intertextis subtomentosis; nervis 4–5-jugatis; cymis terminalibus 1–5 cm. longe pedunculatis laxe ramosis 10–15 cm. crassis; calycibus plus

minusve evidenter 10-costatis, in alabastro globoso-obovoideis ca. 3 mm. longis 2.5 mm. crassis, extus pilis brunneis 0.5–1 mm. longis curvatis appressis vestitis, intus apicem versus sparsissime strigosis, lobis deltoideis erectis ca. 0.9 mm. longis; corolla 7 mm. longa, tubo 3 mm. longo tubum calycis vix superante, faucibus vix differentiatis, lobis oblongis 3.5 mm. longis 1.3 mm. latis recurvatis apice rotundis; filamentis 2.5 mm. supra basim tubi affixis; antheris 1.5 mm. longis oblongis medio-affixis; ovario glaberrimo globoso; fructu ignoto.

GUATEMALA: Las Vacas near Guatemala, habit of apple-tree, 6 m. tall, July 1860, *Sutton Hayes 624* (TYPE, Gray Herb.); Naranjo, dept. Santa Rosa, 800 m. alt., May 1893, *Heyde & Lux 4731* (G, AA).

A very distinct species readily recognized by its combination of denticulate cordate leaves, comparatively well developed petioles, fulvous or rufous indument and stout 10-ribbed calyx. Though very different in general appearance I believe *C. cordiformis* is closely related to *C. diversifolia* Moc. and *C. salvadoriensis* Standley.

Cordia decipiens, sp. nov., "fruticosa" 12 m. alta; ramulis gracilibus dichotomis abundanter laxeque strigoso-velutinis saepe fulvescentibus; foliis ellipticis vel elliptico-ovatis 10–18 cm. longis 6–10 cm. latis ut videtur homomorphis 4–6 mm. longe petiolatis medium versus vel paullo infra medium latoribus, basi obtusis vel rotundis, apice acutis vel obtusis acuminatis, margine apicem versus manifeste pauciserratis, subtus pallidis evidenter elevato-reticulatis, supra viridibus conspicue nervatis, utrinque pilis 0.4–0.8 mm. longis erectis gracilibus vix abundantissimis velutinis, nervis 6–9-jugatis abundanter ramosis; cymis ramosis 8–10 cm. crassis, ramulis fulvescenter velutinis strigosive flexuosis; calycibus sessilibus in alabastro obovoideis 3–3.5 mm. longis 2.5 mm. crassis extus plus minusve evidenter 10-costatis fulvescenter strigoso-velutinis, ad anthesin cupulatis, dentibus 5 deltoideis 1 mm. longis erectis aequalibus; corolla ignota; ovario dense strigoso; fructu oblique ovoideis ascendentibus dense pallide strigosis; calyce fructifero explanato.

BRAZIL: Santa Fe near Manicore, basin of Rio Madeira, Amazonas, "shrub 40 ft. high," terra firma "Chapeu de sol," Sept. 8–11, 1934, *Krukoff 6048* (TYPE, Arn. Arb.).

Much resembling and evidently related to the widely distributed *C. bicolor* DC. From that very constant species it differs in its indument of less abundant somewhat longer more erect hairs, its leaves coarsely dentate above the middle, and its costate calyx glabrous within. The indument on the leaves and calyces is very different from that in *C. bicolor*. On the lower surfaces of the leaves the veinlet-areoles are not covered by abundant appressed minute pale hairs converging from the

veinlets over the areole. The calyx is not smooth with very closely appressed short hairs. I have seen many specimens of *C. bicolor* and all of them have completely entire leaves. Krukoff's specimen has only half matured fruit. These are indistinguishable from those of *C. bicolor* at a similar state of immaturity.

Cordia lomatuloba, sp. nov., arborescens 15–25 m. alta subglabra; foliis coriaceis lanceolatis vel elliptico-lanceolatis homomorphis glaberrimis vel sparsissime perinconspicueque strigosis 8–14 cm. longis 2–5.5 cm. latis utrinque reticulatis medium versus vel paullo sub medium latioribus, supra lucentibus, subtus opacis pallidioribus, margine integerrimis, apice saepe acuminatis, basi acutis in petiolum 8–15 mm. longum sparse strigosum gradatim attenuatis; nervis primariis 6–8-jugatis abundanter manifesteque ramosis; cymis saepe in furcis ramulorum ortis plus minusve brunneo-pubescentibus laxè graciliterque ramosis ca. 10 cm. crassis; calyce sessili in alabastro 2 mm. crasso 2.5 mm. longo crassipyriformi, supra medium crassiore globoso, infra medium basim 0.5 mm. crassam versus abrupte contracto, lobis 5 deltoideis 0.8 mm. longis margine evidenter puberulente excepto subglabris; corolla alba 4 mm. longa, tubo 1 mm. longo, lobis ca. 1.8 mm. latis oblongis recurvatis apice rotundis; staminibus ca. 1.8 mm. supra basim tubi corollae affixis; filamentis basim versus villosis subulatis ca. 1.1 mm. longis; ovario glaberrimo; fructu ignoto.

BRAZIL: near mouth of Rio Macauhan, tributary of Rio Yaco, Acre Terr., basin of Rio Purus, on terra firma, tree 24 m. tall, Aug. 9, 1933, *Krukoff* 5345 (AA); near mouth of Rio Macauhan, terra firma, tree 18 m. tall, fl. white, Aug. 14, 1933, *Krukoff* 5497 (TYPE, Arnold Arb.); Humayta near Tres Casas on restinga alta, Amazonas, basin of Rio Madeira, tree 15 m. tall, "Louro," Sept. 14–Oct. 11, 1934, *Krukoff* 6291 (AA).

The collections cited have been distributed as *C. ecalyculata* Vell., a species which *C. lomatuloba* does simulate in gross aspect. From *C. ecalyculata*, a species of eastern Brazil, the proposed species differs sharply in its calyx, that being pyriform rather than globose in form, firm rather than papery in texture, regularly dehiscent by 5 equal teeth rather than bursting more or less irregularly, and, finally, pubescent along the teeth-margins rather than glabrous. There are also striking differences in the proportions of the corolla. Our plant, in fact seems to be closely related to the distinctly pubescent species of the northwestern Amazon basin and particularly so to *C. naidophila* of that region.

Cordia Mexiana, sp. nov., arborescens 5–7 m. alta; ramulis puberulentis; foliis ellipticis vel oblongo-ellipticis coriaceis utrinque reticulatis,

medium versus latioribus 1.5–4 dm. longis, 8–20 cm. latis, basi rotundis vel late acutis in petiolum 1–2.5 cm. longum abrupte contractis, apice obtusis acuminatis, margine integerrimis, supra lucentibus minutissime punctatis glaberrimis, subtus pallidioribus subpuberulentis, costa falcata; nervis 5–7-jugatis prominenter ramosissimis; cymis laxe ramosissimis ca. 2.5 dm. crassis, ramulis flexuosis strigoso-puberulentis; calycibus in alabastro elongatis ca. 6 mm. longis et 2 mm. crassis apicem versus crassioribus, extus dense breviterque brunneo-strigosis, intus supra medium puberulentis, lobis deltoideis 5 ca. 1 mm. longis erectis; corolla alba elongata 12 mm. longis, tubo 1.5 mm. crasso 4 mm. longo calyci aequilongo, faucibus evidenter differentiatis 2.5–3 mm. longis ad apicem ca. 3 mm. crassis gradatim expansis, lobis oblongis 2 mm. latis 4 mm. longis recurvatis apice rotundis; filamentis 4.5–5 mm. supra basim corollae (0.5–1 mm. supra basim faucium) affixis 7–8 mm. longis longe exsertis basim versus sparse villosis; antheris 1 mm. longis; ovario glaberrimo; stylo profunde bifurcato; fructu ignoto.

PERU: left bank of Rio Marañon below Rancho Indiana, dist. Iquitos, understory overflow bank, 110 m. alt., Jan. 28, 1932, *Mexia* 6459 (TYPE, Gray Herb.). COLOMBIA: Umbría, Com. Putumayo, lat. 0° 54' N., 76° 10' W., 325 m. alt., Dec. 1930, *Klug* 1839 (G).

The cited collections have been distributed as *C. colombiana* Killip. The elongate calyx and the well-developed throat of the corolla separate the plant quickly from *C. colombiana* of the mountains of Ecuador and southern Colombia. The exceptionally elongate tube of the calyx and the very well-developed throat of the corolla are very unusual in the *Pilicordia* section. The species is very distinct and well marked.

Heliotropium Sessei, sp. nov., fruticosum ascendenter ramosissimum; ramulis foliosis pallide adpresseque villosis; foliis alternis lanceolatis firmis 1.5–4.5 cm. longis 2.5–16 mm. latis infra medium laminae latioribus, apice acutis, basi late acutis vel subrotundis in petiolum gracilem appresse villosum 2–5 mm. longum abrupte transmutatis, supra viridibus enervatis sparse graciliterque villosis, subtus albicantibus abundanter graciliterque appresse villosis, margine subplanis; floribus in cymulas saepe geminatas 1–2 cm. longas ebracteatas 5–10-floras terminales vix pedunculatas aggregatis; calyce villosa 2.5–3 mm. longo 0.5–1 mm. longe pedicellato, lobis inaequalibus lanceolatis tubum corollae superantibus; corolla flavescente 4–4.5 mm. longa 2–2.5 mm. diametro extus strigosa intus glaberrima, lobis 1.5 mm. longis 1 mm. latis recurvatis saepe plicatis basim versus latioribus; antheris oblongis obtusis ca. 0.8 mm. longis inclusis ca. 1.2 mm. supra basim tubo corollae affixis, latere puberulentis, apice leviter cohaerentibus; ovario glabro; stigmatibus

subcylindrico 0.6–0.8 mm. longo basim versus in annulum stigmatosum incrassato; stylo 0.3–0.5 mm. longo; fructu ignoto.

MEXICO: Ixmiquilpan, Sierra de la Mesa, Hidalgo, July 1905, *Purpus* 1402 (TYPE, Grey Herb.); Sierra de la Mesa, July 1905, *Rose, Painter & Rose* 9122 (G).

A species related to *H. fallax* of southern Mexico and Guatemala from which it is quickly separated by its smaller more coriaceous yellow corollas, elongate recurving corolla-lobes, puberulent anthers, longer style, smaller cymes, etc.

I am of the opinion that this species is probably conspecific with that published as *Myosotis mexicana* Sesse & Mociño, Fl. Mex. 33 (1893), and given as from "in temperatis N. Hispan. montibus." I have seen in the Sesse & Mociño herbarium from Madrid two specimens (nos. 1725 and 5229) which are labeled *M. mexicana*. These agree perfectly with the description of *M. mexicana* and I believe them to be the basis of that species. They represent a plant collected late in the season and in a very mature state. The corollas, anthers and pistil in size form and pubescence are remarkable like those in the plants from Hidalgo. In fact the chief difference between the plant described by Sesse & Mociño and that which I have described above is that the former has corollas in which the tube surpasses (by ca. 0.5 mm.) the calyx and some leaves in which the nervation is impressed on the upper surface. The fruit is very pilose in *M. mexicana*, as it probably also is in *H. Sessei*. No matter what the eventual disposition of *M. mexicana* may be the name can not be transferred to *Heliotropium* for there already exists an *Heliotropium mexicanum* Sesse & Moc. (1888).

Heliotropium fallax, sp. nov., fruticosum 5–12 dm. altum laxe ramosum pallide vestitum e radice valida oriens; ramulis 1–3 mm. crassis partibus juventate tomentosis (pilis gracilibus saepe curvatis abundantibus) foliosis; foliis bicoloribus ellipticis vel late lanceolatis 1–5 cm. longis 5–20 mm. latis, medium versus laminae vel paullo infra medium latioribus, apice obtusis vel acutis, basi obtusis in petiolum gracilem 3–10 mm. longum abrupte attenuatis, margine vix revolutis, subtus albis strigoso-tomentosis saepissime prominenter paucivenosis, supra viridibus saepissime impresso-venosis sparse strigosis vel hispidulis non rariter pilos basi bulboso-incrassatos gerentibus; floribus in racemos scorpioideos saepe geminatos ebracteatos 3–7 cm. longos 5–25 mm. longe pedunculatos terminales et oppositifloros dense aggregatis; pedicellis 0.5–1 mm. longis ascendentibus; calycibus 2.5–3 mm. longis; corolla alba 4–6 mm. longa extus strigosa intus glaberrima, tubo 2–4 mm. longo quam calyce 0.8–1.5 mm. longiore, limbo patente 3–4 mm. diametro,

lobis planis ovatis ascendentibus 0.8–1.2 mm. longis rotundis; antheris glabris ca. 1.6 mm. longis elongatis ca. 1.5 mm. supra basim corollae affixis inclusis, tertia parte superiore angustiore, apice obtusis pilis brevissimis coronatis cohaerentibus; filamentis subnullis; stigmatibus elongato puberulento 1–1.3 mm. longo basi in annulum incrassato; stylo ca. 0.1 mm. longo; fructu pallide strigoso ca. 2.5 mm. diametro 1.5 mm. alto.

GUATEMALA: Santa Rosa, Baja Verapaz, 1500–1600 m., rocky slopes, April 1887 and July 1908, *von Tuerckheim 1201* and *112315* (G); Cuesta de Cacgil near Salamá, Baja Verapaz, 1200–1600 m., April 1905, *Pittier 158* (G); sparsely wooded limy hill, Chaculá, Huehuetenango, Aug. 3, 1896, *Seler 2992* (G); Aguacatán, Huehuetenango, 1950 m., rocky bushy hillside, frequently rooted in rock crevices, shrub usually 6 but rarely up to 12 dm. tall, fl. white, Dec. 13, 1934, *A. F. Skutch 1922* (TYPE, Gray Herb.). MEXICO: between Hacienda Juncana and San Vicente, Chiapas, 1300–1800 m., Dec. 1895, *Nelson 3502* (G).

Heliotropium fallax* var. *Hintonii, var. nov., a varietate genuina differt radice annua; foliis et ramulis pilis rectis rigidioribus dimorphis (brevibus et duplo longioribus) manifeste vestitis; racemis valde elongatis 1–2 dm. longis.

MEXICO: Ixtapan, dept. Temascaltepec, state of Mexico, in a barranca, 1000 m., March 21, 1933, *G. H. Hinton 3631* (TYPE, Gray Herb.); Salitre, dist. Temascaltepec, along stone fence, 1300 m., Nov. 15, 1932, *Hinton 2599* (G).

This species, *H. fallax*, is a very distinct one of northern Guatemala and adjacent Mexico which has passed as *H. coriaceum* Lehm. The latter was described over a hundred years ago from plants grown at Hamburg from seeds said to have come from Mexico. A careful reading of the original description of *H. coriaceum*, however, will show that it applies much more accurately to the Peruvian, *H. arborescens* L. than to our present plant from Guatemala and Mexico. Indeed the present species seems so devoid of special grace and usefulness that one naturally doubts that it could have been selected for cultivation in Germany. What is more the region in which it grows is not one explored by botanists and plant-collectors during Lehmann's time. Whatever the case may be the species described by Lehmann as *H. coriaceum* differs from our plant of Guatemala and adjacent Mexico in its very large coriaceous rugose leaves, subcorymbose inflorescences, long-tubed colored corollas, and rugose nutlets. All details certainly applicable to the horticulturally attractive *H. arborescens* of Peru.

The variety *Hintonii* is a more herbaceous plant with short-lived root and very much longer and more loosely and abundantly flowered racemes. The indument is composed of more rigid hairs which are of two distinct sorts, one very small and usually appressed and the other longer (1–2 mm. long) and either appressed or spreading. Its geographic range is to the north of that of typical *H. fallax* and far separated for it. It is quite possible that this northern plant may deserve more than varietal recognition.

The two species of *Heliotropium* above described belong to the ebracteate group within the section *Orthostachys*, a natural subdivision containing nine species in South America, cf. Contr. Gray Herb. 81:48 (1928), and seven species in the region to the north. Below I have given a key for the identification of these latter. Synonymy has been provided and all the specimens representative of them in the herbaria at Harvard have been cited.

- Throat of corolla villous within; anthers distinctly contracted to a glandular tip, not coherent; stigma short and stout, sessile.
 Leaves alternate; plant an annual herb; corolla-throat sparsely villous; anther-tips subulate; widely distributed in tropics *H. procumbens*.
 Leaves opposite; plant a shrub; corolla-throat densely villous; anther-tips obtusish; Mexican *H. calcicola*.
 Throat of corolla entirely glabrous; anthers coherent apically, apex obtuse and minutely hairy; stigma elongate.
 Plants West Indian; stigma subsessile.
 Leaves alternate, narrowly lance-linear, 1.5–3 mm. broad. *H. dichroum*.
 Leaves opposite, lanceolate, 4–8 mm. broad *H. uninerve*.
 Plants Mexican; stigma (except in *H. fallax*) with evident style.
 Leaves linear, subulate, lower surface nearly covered by the strongly revolute margins, 0.5–1.2 mm. broad; corollas 4.5 mm. long with plicate recurving cuneate lobes; anthers glabrous on sides *H. angustifolium*.
 Leaves lanceolate to elliptic, margins plane.
 Corolla yellowish, 4–5 mm. long; inflorescence few-flowered, less than 3 cm. long; anthers puberulent on sides; leaves usually veinless; style evident *H. Sessei*.
 Corolla white, 5–7 mm. long; inflorescence abundantly flowered, 3–20 cm. long; anthers glabrous except at apex; leaves usually evidently veined; style scarcely developed *H. fallax*.

Heliotropium calcicola Fernald, Proc. Amer. Acad. Sci. 43:62 (1907). *Antiphytum mexicanum* DeCandolle, Prodr. 10:121 (1846) and Calq. Fl. Mex. tab. 901 (1874), not *H. mexicanum* Sesse & Moc. (1888), nor Greenm. (1898). *Symphitum fruticosum* Sesse & Mociño,

Pl. Nov. Hisp. 21 (1888), not *H. fruticosum* L. *H. petraeum* Brandegee, Univ. Calif. Publ. Bot. 4: 384 (1913). *H. pueblense* Standley, Contr. U. S. Nat. Herb. 23: 1234 (1924).

MEXICO: San Vicente, Tamaulipas, 1926, *Reiche* 1073 (G); San Miguel, Sierra de San Carlos, Tamaulipas, 1930, *Bartlett* 10680 (G); Baños del Carrizal, Vera Cruz, 1912, *Purpus* 6180 (G, ISOTYPE of *H. petraeum*); Tehuacan, Puebla, 1912, *Purpus* 6502 (G, COTYPE of *H. pueblense*); limestone cliffs of Iguala Canyon, Guerrero, 900 m., 10–15 dm. tall, 1906, *Pringle* 10334 (G); Iguala Canyon, 750 m., 6–12 dm. tall, 1905, *Pringle* 10062 (G, TYPE of *H. calcicola*); Cañon de la Mano Negro near Iguala, 1905, *Rose, Painter & Rose* 9368 (G).

DeCandolle's description of *Antiphytum mexicanum* is based upon one of the Mociño plates at Geneva. This plate, number 901 of the DeCandollean series, bears number 288 of the original numbering given by Sesse & Mociño and also their name, *Symphytum fruticosum*. A plant bearing this botanical name is described and their plate no. 288 is cited in their *Plantae Novae Hispaniae* where the plant concerned is given as having come from Chilpancingo, Guerrero. There are three collections (nos. 861, 1716 and 5256) of *H. calcicola* among the Sesse & Mociño specimens at Madrid, all determined as *Heliotropium* and one of them (no. 861) bearing the specific name "*fruticosum*." The plate at Geneva is a good representation of the moderately small-leaved form of *H. calcicola* represented by all three of the specimens mentioned.

The species *H. pueblense* is founded upon material from Tehuacan (*Rose, Painter & Rose* 9979). It is a form of the species with small revolute-margined leaves. It agrees with typical *H. calcicola* in all technical details of reproduction, habit, leaf-arrangement, pubescence, etc.

Heliotropium procumbens Miller, Dict. ed. 8, no. 10 (1768). *H. americanum* Miller, Dict. ed. 8, no. 11 (1768); Johnston, Contr. Gray Herb. 92: 89 (1930). *H. inundatum* Swartz, Prodr. 40 (1788). *H. inundatum* var. *cubense* DeCandolle, Prodr. 9: 540 (1845). *H. rigidulum* DeCandolle, Prodr. 9: 540 (1845). *H. Eggersii* Urban, Symb. Ant. 5: 481 (1908).

A weedy species in moist ground from Louisiana, Texas and Lower California southward through the tropics into South America. Common in Mexico and the West Indies.

I have given above only those names which are based upon material from north of Panama. Complete synonymy, which contains very many names, will be found in my treatment of the South American species, Contr. Gray Herb. 81: 52 (1928). It can be noted here that I was incorrect in citing the name, *H. simplex* Meyen, as a synonym of *H. pro-*

cumbens. A restudy of Meyen's collections at Berlin has shown that the type of *H. simplex* Meyen must be a collection of *H. angiospermum* Murr. which is labeled as from "Peru-Lima 1/31." This collection bears on its label the description given by Meyen in his *Reise*, 1: 436, where he gives the species as from Arica.

Heliotropium dichroum Urban, *Symb. Ant.* 5: 481 (1908) and 8: 590 (1921).

HAITI: Morne Bonpère, 500 m. alt., shrub 6–12 dm. tall, fl. white, *Buch* 729 (G, part of TYPE).

This endemic of Haiti agrees with *H. calcicola* in its opposite leaves and in the general nature and distribution of its strigose indument. The floral structures, however, seem very different from those in the Mexican species.

Heliotropium uninerve Urban, *Arkiv Bot.* 17: no. 7, p. 51 (1921).

HAITI: between Port à Piment and Randelle, dept. Sur., limestone hills, Aug. 12, 1917, *Ekman* 675 (G, part of TYPE); Morne Rouge near Chapelle Mont Carmel, in arid calcareous hills at east end of Morne de la Hotte, dept. Sur., 600 m., Nov. 7, 1924, *Ekman* 2410 (G).

The strigose indument is very similar to that of *H. dichroum*. The two collections cited are very similar. Their leaves are distinctly narrower than in *H. dichroum* and show no tendency to be opposite.

Heliotropium angustifolium Torrey, *Bot. Mex. Bound.* 137 (1859).

TEXAS: south of Loma Alta, McMullen Co., 1935, *Cory* 17204 (G); Montell, Uvalde Co., dry limestone hills, 1917, *Palmer* 12322 (G); Devils River, Valverde Co., rocky hills, 1900, *Eggert* (G); Del Rio, Valverde Co., 1930, *Jones* 25639 (G); 25 mi. northeast of Dryden, Terrell Co., 1930, *Cory* 3380 (G); Rio Grande Valley, 1936, *Parks* (G); Guadalupe Mts., 1882, *Havard* 27 (G); western Texas, 1890, *Nealley* 236 (G); head of the San Felipe, July 7, 1849, *Wright* 480 (G); stony prairies on Zoquete Creek, May 18, 1851, *Wright* 1546 (G). CHIHUAHUA: Cerro de Chupaderos near Jiménez, 1925, *Juzepczuk* 635 (G). COAHUILA: Sierra Mojada, 1925, *Juzepczuk* 667 (G); Saltillo, 1898, *Palmer* 36 (G); Cerro de Zapatero, 1910, *Purpus* 4558 (G); Soledad, 1880, *Palmer* 880 (G); Caracol Mts. southeast of Monclova, 1880, *Palmer* 879 (G); Juray, 100 mi. north of Monclova, 1880, *Palmer* 881 (G). NUEVO LEON: near Monterey, *Seler* 1054, *Pringle* 1880, *Palmer* 405 and 878 (G); Sabinas Hidalgo, 1933, *Mueller* 330 (G); Sierra Madre, 15 mi. southwest of Galeana, 1934, *Mueller* 977 and 1112 (G). TAMAULIPAS: near Victoria, 1907, *Palmer* 578 (G); Jaumaue, 1932, *Rozynski* 461 (G); Sierra de San Carlos, 1930, *Bartlett* 10605 (G).

INDEFINITE: road between Doctor Arroyo, N. L., and Matchuala, S. L. P., 1898, *Nelson 4514* (G); no locality given, 1848-49, *Gregg 298* (G).

When he described this species Torrey gave it as based upon collections from "Western Texas and along the Rio Grande, south to Eagle Pass, March-October. Near Monterey, Mexico, *Dr. Edwards and Major Eaton* (No. 480 and 1546, *Wright*). Among its relatives this species is quickly distinguished by its very narrow strongly revolute-margined leaves. The racemes are characteristically solitary and opposite the leaves. Occasionally a bract may be developed near the base of the inflorescence though prevailing it is bractless. The corolla is given as greenish or cream-colored.

Heliotropium convolvulaceum* var. *racemosum (Rose & Standley), comb. nov. *Euploca racemosa* Rose & Standley, Contr. U. S. Nat. Herb. 16: 17 (1912).

TEXAS: east of Encino, Brooks Co., 1935, *Cory 14208* (G); Atascosa County on highway near Bexar county line, 1935, *Cory 15521* (G); eleven miles northwest of Poteet, Frio Co., 1935, *Cory 11716* (G); Llano, Llano Co.?, July 1848, *Lindheimer* (G); 30 mi. west of San Antonio, Bexar Co., Sept. 1879, *Palmer 889* (G, ISOTYPE); Rio Coletto, Sept. 1885, *Thurber 12* (G).

This is a geographical variety which replaces the typical form of the species in southern Texas. It is a much more freely branched plant with more abundantly flowered denser racemes and conspicuously smaller flowers. The corollas are only 5-8 mm. in diameter.

Heliotropium Jaffuelii, sp. nov., fruticosum erectum glutinosum pilis crassis inconspicuis brevibus adpressis vestitum, gracile laxè ramosum; foliis linearibus 5-10 mm. longis 0.5-0.8 mm. latis crassiusculis plus minusve fasciculatis subteretibus apice obtusis margine non rariter revolutis; floribus terminalibus in cymulas plures scorpioideas ebracteatas 1-4 cm. longas graciles rigidas dispositis; calycibus ca. 1.5 mm. longis 0-0.9 mm. longe pedicellatis carnosulis, lobis oblongis ca. 0.8 mm. longis apice obtusis dorso convexis, sinibus acutis; corolla 2.5-3 mm. longa glaberrima, limbo 2.5-3 mm. diametro, lobis rotundis ca. 0.8 mm. latis et longis; faucibus vix differentiatis; staminibus ca. 1 mm. supra basim tubi corollae affixis; antheris ca. 1 mm. longis lanceolatis glabris, apice acutis glandulosis paullo exsertis; stigmatè conico ca. 0.7 mm. longo ca. 0.6 mm. crasso apice truncatulo bidentato; stylo brevissimo; ovario glabro; nuculis ignotis.

CHILE: Tocopilla, Sept. 1931, *Father Felix Jaffuel 2524* (TYPE, Gray Herb.).

A species related to *H. chenopodiaceum* Clos but differing in its copiously glutinous leaves, twigs and calyces, thicker weakly revolute leaves, smaller corollas, and stout broadly conic (rather than very elongate) stigma. The stems and leaves bear curious short appressed falcate hairs. These are scattered and are immersed in the copious clear waxy-glutinous secretion which covers all the growing vegetative parts of the plant.

It is a pleasure to associate the name of Father Felix Jaffuel with another distinctive species of the Nitrate Coast. Taking advantage of the brief halts of the coast steamers, while traveling for his Order, he has made a number of highly interesting collections about the ports of arid northern Chile and has thereby contributed much to our scanty knowledge of the flora of that region.

Heliotropium eremogenum, sp. nov., fruticosum decumbens ramissimum griseum pilis gracilibus falcatis appressis vestitum; foliis firmis integerrimis 4–8 mm. longis 1–2 mm. latis oblanceolatis supra medium latoribus, margine revolutis, apice acutis; floribus in cymulas terminales scorpioideas 0.5–2 cm. longe pedunculatas congestis; calycibus saepissime sessilibus 3 mm. longis basim versus in lobos lineari-cuneatos erectos 5-fidis; corolla (ut videtur alba vel ochroleuca) ca. 6 mm. longa extus sparse strigosa intus glabra, limbo ca. 6 mm. diametro, tubo lobos calycis 1–1.5 mm. longe superante ca. 4 mm. longo, lobis rotundis 2 mm. diametro; antheris linearibus ca. 1.8 mm. longis inclusis 2.5 mm. supra basim tubi corollae affixis; stigmatibus ca. 1.5 mm. longo columnari imam ad basim in anulum stigmatosum angustum incrassato; ovario glabro.

CHILE: Antofagasta, Oct. 29, 1930, *Felix Jaffuel 1120* (TYPE, Gray Herb.); Antofagasta, Nov. 6, 1931, *Felix Jaffuel 2639* (G); Antofagasta, open rocky quebrada, 100–300 m. alt., April 3, 1925, *Pennell 13022* (G).

A relative of *H. Philippianum* Johnston, from which it differs in its decumbent habit, more copious grayish indument, very much smaller leaves, and proportionately shorter style. The incomplete collection by Pennell has been recognized for some years, cf. Contr. Gray Herb. 81: 38 (1928) and 85: 155 (1929), as representing what was probably an undescribed species. Happily Father Felix Jaffuel has collected the same interesting species in good flowering condition and the description of this new addition to the flora of the Nitrate Coast is now possible. The material from Iquique, which I formerly associated with Pennell's collection, appears to be conspecific with some collections recently made at Tocopilla by Father Jaffuel. The material at hand of this plant of Iquique and Tocopilla is, unfortunately, fragmentary. When good collections of it become available for study I believe that it will prove to represent a third species endemic to the Nitrate Coast.

Heliotropium anomalum* var. *mediale, var. nov., a varietate genuina differt gracilioribus erectioribus ascendente ramosis saepe 3–5 rariter 15 dm. altis; foliis gracilioribus leviter strigosis oblanceolatis vel linearibus acutis; calycibus minoribus ca. 2 mm. longis.

CHRISTMAS ISLAND: 4 miles west of Manulu Lagoon, shrub forming rounded mass 4 dm. tall, Oct. 21, 1934, *St. John & Fosberg 17486* (TYPE, Bishop Mus.; G, ISOTYPE), 17487 (G); Joe's Hill, prostrate, *St. John & Fosberg 17494* (G). FANNING ISLAND: Vai Tepu, saline flat, bush 5–15 dm. tall, April 22, 1934, *St. John & Fosberg 14121* and *14122* (G); Cable Islet, coral slabs, 3–4 dm. tall, April 21, 1934, *St. John & Fosberg 14109* and *14110* (G).

Typical *H. anomalum* H. & A. of southern and eastern Polynesia is a coarser and more laxly branched prostrate or trailing plant with coarser much more loosely appressed indument, larger inflorescences and coarser calyces. The Hawaiian var. *argenteum* Gray, Proc. Amer. Acad. 5: 339 (1861), is similar to typical *H. anomalum* except for its closely appressed lustrous silky indument. In indument, therefore, the plants of Christmas and Fanning islands much resemble the Hawaiian variety. The var. *mediale*, however, is very different from the Hawaiian form in its bushy habit, very slender leaves, smaller calyces, etc.

***Echium connatum* Léveillé**, Cat. Pl. Yunnan 22, fig. 4 (1915).

This is not a species of the Boraginaceae, but one of the Caprifoliaceae, *Triosteum himalayanum* Wall. I have seen the type at Edinburgh.

***Arnebia Hancockiana* (Oliver)**, comb. nov. *Lithospermum Hancockianum* Oliver, Hooker's Icones 25: tab. 2467 (1896). *Lithodora Hancockiana* (Oliver) Handel-Mazzetti, Symb. Sin. 7: 818 (1936). *Lithospermum Mairei* Léveillé in Fedde, Repert. 12: 286 (1913).

An examination of the type of *L. Mairei* proves it an evident synonym of Oliver's species. Recently Handel-Mazzetti has treated this endemic of Yunnan as a member of the Mediterranean genus *Lithodora*. Though fruit of this Chinese plant is unknown and it can not therefore be excluded from *Lithodora* with finality, I am positive that it is not a member of the genus *Lithodora* but rather of the great Asiatic genus *Arnebia*. Its relations are with such Asiatic species as *A. euchroma* (Royle) Johnston and *A. fimbriata* Maxim.

***Lithospermum officinale* Linnaeus**, Sp. Pl. 132 (1753). *L. albiflorum* Vaniot, Monde des Plantes, sér. 2, 7: 42 (1905); Fedde, Repert. 2: 197 (1906); Léveillé, Fl. Kouy-Tchéou 54 (1914).

I have examined the type of *L. albiflorum* Vaniot, now preserved at Edinburgh, and find it inseparable from the common form of *L. officinale* growing in eastern Asia.

Amsinckia intermedia Fischer & Meyer, Ind. Sem. Hort. Petrop. 2: 2 and 26 (1836). *Lithospermum Komarovianum* Léveillé in Fedde, Rept. 8: 280 (1910).

Léveillé's species was based upon collections having only immature fruit. As far as comparisons can be made it seems inseparable from the common and variable *A. intermedia* of California. I suspect it is the same introduced species as that reported from Saghalin by Mayabe & Miyake, Fl. Saghalin (1915), under the name *A. tessellata*.

Onosmodium dodrantale, sp. nov., rhizomatosum; caulibus pluribus simplicibus 1.5–2.5 dm. altis erectis foliosis 2 mm. crassis hirsutis; foliis oblongis vel ovato-oblongis nervatis supra medium caulis grandioribus (3–4.5 cm. longis 6–15 mm. latis) basim versus caulis evidenter reductis pilis 1 mm. longis rectis appressis e basi pustulato-bulbosa erumpentibus vestitis, infra medium laminae latioribus apice acutis vel obtusis basi rotundis subsessilibus supra viridioribus; cymulis terminalibus solitariis ca. 5-floris foliosis; calyce ad anthesin ca. 1 cm. longo hirsuto, lobis linearibus erectis 0.5–1 mm. latis acutis tubo corollae aequilongis, pedicello 2–5 mm. longo; corolla flava 12–18 mm. longa extus in faucibus lobisque strigosa intus (lobis exceptis) glaberrima; lobis 3–3.5 mm. longis 2–2.5 mm. latis a basi apicem versus gradatim attenuatis virescentibus erectis, sinibus acutis; staminibus 9–10 mm. supra basim corollae (imam ad basim faucium plus minusve ampliatae) affixis inclusis glaberrimis, filamentis lateraliter compressis ca. 1.2 cm. longis; antheris elongatis 2–3 mm. longis apice in subulas graciles ca. 0.2 mm. longas abrupte contractis basi subcordulatis; stylo ca. 2 cm. longo filiformi 2–4 mm. longe extruso, stigmatibus minutissime geminatis; nuculis ignotis.

MEXICO: Cerro Potosi, Galeana, Nuevo Leon, scattered colonies in upper pine woods, fl. cream-yellow, July 21, 1935, *C. H. Mueller 2259* (TYPE, Gray Herb.); El Infernillo, ca. 25 km. southwest of Galeana, Nuevo Leon, 2700–3000 m. alt., common, fl. yellow with greenish lobes, July 29, 1934, *Mueller 923* (G); El Infernillo, Pablillo, southwest of Galeana, rocky summit, 3000–3100 m., fl. yellow, June 29, 1934, *Pennell 17116* (G).

A well-marked species notable for its small stature, simple stems, reduced lower leaves and small few-flowered cymes. It may be separated from *O. unicum* Macbr., of southern San Luis Potosi, and from *O. bejariense* DC., of Texas, by having a simple indument of spreading or appressed hairs. In the two relatives the indument is duplex there being fine short usually appressed hairs under the coarse hispidity clothing the stems and leaves.

Cryptantha (§ OREOCARYA) **Grahamii**, sp. nov., perennis caespitosa; caudice denso breviter ramoso e radice crasso lignoso oriente; caulibus 1–2 dm. altis erectis setosis et adpresse pubescentibus supra medium fertilibus; foliis viridibus utrinque pilis minutis inconspicuis vestitis et setis ca. 2 mm. longis (e basi pustulata orientibus) horridis, basalibus 3–4.5 cm. longis supra medium in laminam lanceolato-ovata 5–10 mm. latam explanatis apice rotundis vel obtusis, caulinis oblanceolatis vel oblongis medis 2–2.5 cm. longis 6–7 mm. latis obtusis; inflorescentia elongata laxa; cymulis laxis 3–10-floribus setosis bracteis foliaceis suffultis; calycibus abundanter setosis et pubescentibus ad anthesim ca. 7 mm. longis, lobis lineari-lanceolatis acutis fauces corollae 0.5–1 mm. superantibus; pedicellis gracilibus 0.5–1 mm. longis; corolla alba conspicua, limbo patente 12–16 mm. lato, lobis rotundis ca. 5 mm. latis et longis, tubo cylindrico 5–6 mm. longo 1–1.3 mm. crasso; ovulis 4; nuculis ignotis.

UTAH. Uinta County: bench west of Green River north of mouth of Sand Wash, 4500 ft. alt., fl. white, May 28, 1933, *Edward H. Graham* 7924 (TYPE, Gray Herb.) and 7927 (G); east slope of Big Pack Mt., west of Willow Creek near Thome Ranch, 5400 ft., on light-colored slate bench, fl. white, May 23, 1935, *Graham* 8962 (G); shale breaks east of Willow Creek, 5 mi. north of Agency Draw, 5500 ft., fl. white, fragrant, *Graham* 8937 (G).

A very distinct and readily recognizable species. Its conspicuous white corollas are the largest known in the genus. The immature nutlets appear to be smooth and rather similar to those of *C. confertiflora* (Greene) Payson. I can suggest no close relative for this remarkable new species.

The species is named for Dr. Edward H. Graham of the Carnegie Museum of Pittsburgh who discovered it during his intensive botanical investigation of the Uinta Basin of northeastern Utah. It is eminently fitting that his name should be associated with this remarkable endemic of the region he has studied so thoroughly.

Cryptantha (§ KRYNITZKIA) **Hooveri**, sp. nov., herbacea annua 5–15 cm. alta laete viridis; caulibus solitariis vel pluribus erectis vel non rariter basim versus subdecumbentibus gracilibus 0.5–1.2 mm. crassis strigosis infra medium simplicibus supra medium breviter ascendenterque ramosis; ramulis floriferis 1–2.5 cm. longis; foliis ascendentibus crassulis firmis pilis rigidis adpressis (vel in foliis supremis pilis ascendentibus) vestitis, subtus prominenter costatis abundanter pustulatis, supra sparse pustulatis; foliis basalibus caulis ramorumque evidenter oppositis 10–25 mm. longis angustissime spathulatis apicem obtusam versus 0.9–2.2 mm.

latis, margine saepe subplanis; foliis caulinis ramulisque mediis et superioribus alternis sublinearibus 1 mm. latis 1–2 cm. longis apice acutis margine revolutis; inflorescentia elongata dense thyrsoida vel paniculata; floribus in axillis foliorum glomerulatis vel solitariis haud scorpioideis; calycibus fructiferis elongatis subsessilibus 4–5 mm. longis tarde deciduis; lobis calycis maturi linearibus in costa setis flavescentibus 2–3 mm. longis munitis et in marginibus dense ascendenter villosis; corolla inconspicua tubulosa 2–2.5 mm. longa ad anthesim calycem ca. 3 mm. longam vix superante; nuculis 4 homomorphis (nucula adaxillari subpersistenti?) triangulari-ovatis ca. 1.3 mm. longis ca. 0.9 mm. latis lucentibus, apice acutis, basi late truncatis, margine acutis minime incrassatis, dorso convexis prominenter papillatis, ventre obtuse angulatis sparse tuberculatis $\frac{3}{4}$ longitudinis ad gynobasim angustum ca. 1 mm. longam afixis sulco infra medium in areolam deltoideam abrupte dilatatis; stylo nucas vix superante.

CALIFORNIA: eight miles west of Chowchilla, Madera Co., a single colony in dry coarse sand, May 7, 1935, *R. F. Hoover 558* (TYPE, Gray Herb.); Gobin Ranch, about 13 mi. east of Waterford, Stanislaus Co., in coarse sand on a flat among rolling hills, May 2, 1936, *Hoover 1103* (G); sand hills east of Antioch, Contra Costa Co., April 16, 1908, *Heller 8888* (G).

I can suggest no close relative for this very distinct species. The peculiar inflorescence, characterized by a complete lack of scorpioid cymes, is unique among the North American species of the genus. The nutlets though not aberrant are distinctive and I believe the species can be recognized from them alone. The corollas are very small and possibly may be cleistogamic though the corollas surmounting the ripening ovary have their tiny lobes expanded and not permanently closed as in the indubitably cleistogamic flowers of the South American section *Eucryptantha*.

I have associated with this unusual species the name of Mr. Robert F. Hoover of Modesto, Calif., to whom I am indebted for the excellent specimens here described. The material was collected by Mr. Hoover during botanical trips about the San Joaquin Valley made in furtherance of his study of the floristics of that region. It is a pleasure to associate his name with this remarkable addition to the known flora of that interesting area.

Cryptantha corollata (Johnston), comb. nov. *C. decipiens* var. *corollata* Johnston, Contr. Gray Herb. 74: 61 (1925); Johnston in Munz, Man. So. Calif. Bot. 428 (1935).

Since this plant of the drier inner Coast Ranges of California was first

distinguished over ten years ago I have seen many collections of it. Among the scores of specimens studied I have found none that give any indication that *C. corollata* and *C. decipiens* intergrade in any way, or that their geographical ranges overlap or even approach one another closely. The plant I distinguished as *corollata* is very constant and readily identifiable and has a range that is eminently natural. I now believe it should be given specific recognition.

Hackelia brachytuba (Diels), comb. nov. *Paracaryum brachytubum* Diels, Notes Royal Bot. Gard. Edinburgh 5: 168 (1912). *Lappula Dielsii* Brand in Fedde, Repert. 14: 147 (1915). *Hackelia Dielsii* (Brand) Johnston, Contr. Gray Herb. 68: 45 (1923).

The type of *P. brachytubum* came from the Tali Valley (*Forrest 4474*) that of *L. Dielsii* from the Likiang Range (*Forrest 2255*), also in Yunnan. They are evidently conspecific.

Trigonotis sericea (Maxim.), comb. nov. *Omphalodes sericea* Maximowicz, Bull. Acad. Sci. St. Pétersb. 17: 453; Mém. Biol. 8: 558 (1872).

This species is evidently a relative of *T. Icumae* (Maxim.) Makino, *T. radicans* Maxim. and *T. myosotideae* Maxim. and not a member of the genus *Omphalodes* as it has been accepted for so long.

Antiotrema Dunnianum (Diels) Handel-Mazzetti, Anzeiger Akad. Wiss. Wien 57: 239 (1920). *Cynoglossum Dunnianum* Diels, Notes Royal Bot. Gard. Edinburgh 5: 168 (1912). *Cynoglossum Cavaleriei* Léveillé in Fedde, Repert. 12: 534 (1913) and Cat. Seu-Tchouen, tab. 5 (1918). *Henreyettana mirabilis* Brand in Fedde, Repert. 26: 171 (1929).

The type of *C. Cavaleriei* (*Cavalerie 2117*) has its flowers at anthesis and shows no fruit. It is a mediocre specimen but one clearly conspecific with the type of *A. Dunnianum*. Léveillé had other collections of the species, *Bodinier 1579* and *2160*, which do possess mature fruit but these were not associated by him with his *C. Cavaleriei*. They are in fact the basis upon which he reported, *Bothriospermum Kusnezowii* from Kweichow, Fl. Kouy-Tchéou 52-53 (1914).

In his recent treatment of this remarkable plant, Handel-Mazzetti, Symb. Sin. 7: 825 (1936), is incorrect in stating that the nutlets and embryo are "erect." As I have already indicated, Contr. Gray Herb. 75: 44-45 (1925), the nutlets and embryos are in fact inverted in *Antiotrema*. This is a very unusual condition in the Boraginaceae and is found in only two other genera of the family.

HERBARIUM, ARNOLD ARBORETUM,
HARVARD UNIVERSITY.

NOTES ON THE LIGNEOUS PLANTS DESCRIBED BY H. LEVEILLE FROM EASTERN ASIA¹

ALFRED REHDER

ROSACEAE

Rubus L.

Subgen. CYLACTIS (Raf.) Focke

Rubus fragarioides Bertol. var. *adenophora* Franchet, Pl. Delavay. 203 (1890).

Rubus Franchetianus Léveillé in Bull. Acad. Intern. Géog. Bot. 20 (Mém.): 71 (1909). — Focke in Bibl. Bot. 19 (83): 16 (Spec. Rub. 240) (1914).

There is no specimen of this plant in the Léveillé herbarium. I have seen the type of this variety in the Paris herbarium and have a photograph of it before me; it does not seem to be specifically different from typical *R. fragarioides* Bertol. which is referred by Focke in 1910 (op. cit. 17: 24) as a variety (or subspecies) to *R. arcticus* L.; in 1914 (l.c.) he enumerates *R. Franchetianus* with the synonym *R. fragarioides* var. *adenophora* Franch., a name not mentioned by him in 1910.

Rubus pseudo-japonicus Koidzumi in Bot. Mag. Tokyo, 25: 74 (1911); in Jour. Coll. Sci. Univ. Tokyo, 34, 2: 110 (1913).

Rubus japonicus (Maxim.) Focke in Abh. Naturw. Ver. Bremen, 4: 192, 198 (1874); in Bibl. Bot. 17 (72¹): 26 (Spec. Rub.) (1910). — Non Linné f.

Rubus triflorus Rich. var. *diversifolius* Léveillé in Bull. Soc. Agr. Sci. Arts Sarthe, 40: 58 (1905); in Fedde, Rep. Spec. Nov. 2: 174 (1906); in Bull. Acad. Intern. Géog. Bot. 20 (Mém.): 122 (1909).

Rubus pseudo-japonicus var. *diversifolius* (Lévl.) Koidzumi in Jour. Coll. Sci. Tokyo, 34, 2: 110 (1913). — Makino & Nemoto, Nippon-shokubutsu-sōran, ed. 2, p. 522 (1931).

JAPAN. HOKKAIDO: in silvis Hakodate, U. Faurie, no. 6070, June 1, 1904 (holotype of *R. triflorus* var. *diversifolius*; isotype in A. A.).

Léveillé describes his variety as having simple and compound leaves

¹Continued from Vol. 17: 316-340; for preceding parts see Vols. 10: 108-132, 164-196; 12: 275-281; 13: 299-332; 14: 223-252; 15: 1-27, 89-117, 267-326; 16: 311-340; 17: 53-82.

on the same stem, but the type specimen, which, however, does not bear Léveillé's name, has all the leaves either ternate or quinate. In 1909 Léveillé reprints under *R. triflorus* Rich. the description given by Thunberg (Fl. Jap. 216. 1784) for his *R. caesioides* (non L.), but that description applies apparently to a species of the Subgen. *Idaebatus*.

Rubus ikenoensis Léveillé & Vaniot in Bull. Soc. Bot. France, **53**: 549 (1906). — Léveillé in Bull. Acad. Intern. Géog. Bot. **20** (Mém.): 130 (1909). — Koidzumi in Jour. Coll. Sci. Tokyo, **34**, 2: 109 (1931). — Focke in Bibl. Bot. **17** (72^{II}): 165 (Spec. Rub.) (1911).

Rubus defensoides Focke in Bibl. Bot. **17** (72^{II}): 26 (Spec. Rub.) (1910). — Cardot in Bull. Mus. Hist. Nat. Paris, **23**: 273 (1917).

JAPAN. H o n d o : in sylvis Norikusa, 2000 m., *U. Faurie*, no. 6687, Aug. 28, 1905 (holotype of *R. ikenoensis*; photo. in A. A.).

Focke himself in 1911 identified his *R. defensoides* with *R. ikenoensis*. From the preceding it differs chiefly in the setose stems and petioles and the deeply incised doubly serrate leaflets.

Subgen. MALACHOBATUS Focke

Sect. *Sozostyli* Focke

Rubus refractus Léveillé in Fedde, Rep. Spec. Nov. **4**: 332 (1907); in Bull. Acad. Intern. Géog. Bot. **20** (Mém.): 54 (1909); Fl. Kouy-Tchéou, 359 (1915). — Focke in Bibl. Bot. **17** (72^I): 62 (Spec. Rub.) (1910); **19** (83): 22, fig. 3 (Spec. Rub. 246, fig. 90) (1914). — Cardot in Bull. Mus. Hist. Nat. Paris, **23**: 278 (1917).

CHINA. K w e i c h o u : Chang-ieoumay, *J. Esquirol*, no. 356, April 1, 1905, "fleur blanche, le tout renversé en bas" (holotype; photo. in A. A.).

Cardot (l.c.) points out that this species differs from the other species of the *Sozostyli* in the bracts and stipules being divided into filiform lobes and that in this respect it approaches the *Alceaefolii*; he proposes its separation as a new section "*Refracti*." This section would include the following species. He also described a new variety *R. refractus* var. *latifolius* (see under *R. alceaefolius*, p. 33).

Rubus Rocheri Léveillé in Bull. Acad. Intern. Géog. Bot. **24**: 250 (1914); Fl. Kouy-Tchéou, 360 (1915); Cat. Pl. Yun-Nan, 240, fig. 60 (1917).

CHINA. K w e i c h o u : Ta-pin, 1200 m., *J. Esquirol*, no. 3526, March 25, 1912 (holotype; photo. in A. A.).

This species is very close to the preceding, but is easily distinguished by the dense fulvous tomentum of the stem, the rachis and pedicels of

the inflorescence and of the underside of the leaves which are smaller, not or scarcely lobed, more sharply and closely serrate, appressed-pilose above and deeply cordate.

Rubus malifolius Focke in Hooker's Ic. Pl. **20**: t. 1947 (1890); in Bibl. Bot. **17** (72¹): 42 (Spec. Rub.) (1910). — Cardot in Bull. Mus. Hist. Nat. Paris, **23**: 275 (1917).

Rubus arbor Léveillé & Vaniot in Bull. Soc. Bot. France, **51**: 217, pl. 3 (1904). — Léveillé in Bull. Acad. Intern. Géog. Bot. **20** (Mém.): 26 (1909); Fl. Kouy-Tchéou, 357 (1915).

CHINA. K w e i c h o u : Pin-fa, route de Siao-tchang, *J. Cavalerie*, no. 1003, May 7, 1903, "arbre, fl. blanches" (holotype of *R. arbor*; photo. in A. A.).

According to the collector's note this is a tree. However, in reality it is only a tall climber and Handel-Mazzetti (Symb. Sin. **7**: 486) calls it perhaps the tallest *Rubus* climbing on trees up to a height of 20 m.

Rubus Mairei Léveillé in Bull. Acad. Intern. Géog. Bot. **22**: 232 (1912); Cat. Pl. Yun-Nan, 239 (1917).

CHINA. Y u n n a n : Tong-tchouan, broussailles, 2700 m., rare, *E. E. Maire*, (Herb. Bonati, no. 7491), Aug. 1910, "un peu grim pant, fl. blanches" (holotype in Herb. Léveillé; isotype in Herb. Calif.; photo. in A. A.).

This species is closely related to *R. preptanthus* Focke, but is easily distinguished by the narrow-lanceolate leaves only 1–1.5 cm. broad, more remotely and finely serrate, by the shorter petioles 3–5 mm. long and the more copiously armed branches. Handel-Mazzetti (Symb. Sin. **7**: 486. 1933) refers *R. Mairei* to *R. Henryi* Hemsl. & Ktze.; but from that species it differs in the deciduous, thinner always undivided leaves, in the much shorter petioles and the short, almost corymbose often few-flowered racemes with pedicels 1–1.5 cm. long.

Sect. *Elongati* Focke

Rubus chroosepalus Focke in Hooker's Ic. Pl. **10**: t. 1952 (1891); in Bibl. Bot. **17** (72¹): 52, fig. 15 (Spec. Rub.) (1910); in Sargent Pl. Wilson. **1**: 49 (1911). — Léveillé, Fl. Kouy-Tchéou, 360 (1915); Cat. Pl. Yun-Nan, 236 (1917). — Handel-Mazzetti, Symb. Sin. **7**: 491 (1933).

Rubus Mouyousensis Léveillé in Fedde, Rep. Spec. Nov. **4**: 333 (1907); in Bull. Acad. Intern. Géog. Bot. **20** (Mém.): 44 (1909); Fl. Kouy-Tchéou, 359 (1915). — Focke in Bibl. Bot. **17** (72¹): 62 (Spec. Rub.) (1910).

Rubus petaloideus Léveillé in Fedde, Rep. Spec. Nov. **12**: 506 (1913).

CHINA. K w e i c h o u : Mou-you-se, *J. Cavalerie*, no. 1416, June 1904 (holotype of *R. Mouyousensis*; photo. in A. A.); Chouan-chang-po, à la sortie du bourg, *J. Esquirol*, no. 3141, May 1911 (holotype of *R. petaloideus*; photo. in A. A.).

Rubus Mouyousensis was identified with *R. chroosepalus* by Handel-Mazzetti (l.c.) and *R. petaloideus* was enumerated as a synonym of *R. chroosepalus* by Léveillé in 1915 (l.c.) and 1917 (l.c.).

Rubus Gentilianus Léveillé & Vaniot in Bull. Acad. Intern. Géog. Bot. 11: 99 (1902); 12 (no. 60): t. 3 (1903); 20 (Mém.): 35 (1909); Fl. Kouy-Tchéou, 358 (1915); in Bull. Soc. Agr. Sci. Arts Sarthe, 45: 219, fig. 3 (Pl. Util. Orn. Kouy-Tchéou, 45, fig. 3) (1915); Cat. Pl. Yun-Nan, 239 (1917); Cat. Ill. Pl. Seu-Tchouen, pl. 60 (1918). — Focke in Bibl. Bot. 17 (72¹): 53 (Spec. Rub.) (1910); 19 (83): 26, fig. 5 (Spec. Rub. 250) (1914); in Sargent, Pl. Wilson. 1: 50 (1911). — Cardot in Bull. Mus. Hist. Nat. Paris, 23: 279 (1917). — Handel-Mazzetti, Symb. Sin. 7: 491 (1933). — Merrill in Lingnan Sci. Jour. 13: 28 (1934).

CHINA. K w e i c h o u : environs de Tsin-gay, rocailles, *E. Bodinier*, no. 2367, June 27, 1899; environs de Kouy-yang, mont du Collège, rocailles, ruisseaux, *E. Bodinier*, no. 2367, June 16, 1898 (syntypes; photos. in A. A.).

This species has been collected in Kweichou also by Handel-Mazzetti (no. 10419) and by Steward, Chiao & Cheo (no. 57). It is also known from Szechuan (E. H. Wilson, no. 1127, and W. P. Fang, no. 2537) and from Kwangtung (W. T. Tsang, no. 20611).

Rubus ichangensis Hemsley & Kuntze in Jour. Linn. Soc. Bot. 23: 231 (1887). — Focke in Bibl. Bot. 17 (72¹): 55, fig. 18 (Spec. Rub.) (1910); 19 (83): 26 (Spec. Rub. 250) (1914); in Sargent, Pl. Wilson. 1: 50 (1911). — Léveillé, Fl. Kouy-Tchéou, 360 (1915). — Cardot in Bull. Mus. Hist. Nat. Paris, 23: 279 (1917).

Rubus Papyrus Léveillé in Fedde, Rep. Spec. Nov. 4: 332 (1907); in Bull. Acad. Intern. Géog. Bot. 20 (Mém.): 30 (1909). — Focke in Bibl. Bot. 17 (72¹): 56 (Spec. Rub.) (1910).

CHINA. K w e i c h o u : Pin-fa, montagnes, *J. Cavalerie*, no. 1439, Oct. 27, 1903 (holotype of *R. Papyrus*; photo. in A. A.).

Rubus Papyrus was first identified with *R. ichangensis* by Focke in 1914 (l.c.). The species is represented in this herbarium from Kweichou, also by no. 10647 of Handel-Mazzetti and by nos. 5587, 5733, 7504 and 9230 of Y. Tsiang and by numerous specimens from Szechuan and some from Hupeh.

Sect. *Acuminati* Focke

Rubus Lambertianus Ser. var. *minimiflorus* (Lévl.) Cardot in Bull. Mus. Hist. Nat. Paris, **23**: 281 (1917). — Handel-Mazzetti, Symb. Sin. **7**: 489 (1933).

Rubus minimiflorus Léveillé in Bull. Acad. Intern. Géog. Bot. **20** (Mém.): 32 (1909); Fl. Kouy-Tchéou, 359 (1915). — Focke in Bibl. Bot. **17** (72¹): 56 (Spec. Rub.) (1910); **19** (83): 28 (Spec. Rub. 252) (1914).

CHINA. K w e i c h o u : Pin-fa, montagnes, *J. Cavalerie*, no. 1775, Apr. 17, 1904 (holotype of *R. minimiflorus*; photo. in A. A.).

Focke in 1914 (l.c.) refers to the possible identity of his *R. pycnanthus* with *R. minimiflorus*, but the description of the former differs in several characters from the type of the latter.

Rubus paykouangensis Léveillé in Fedde, Rep. Spec. Nov. **4**: 333 (1907); in Bull. Acad. Intern. Géog. Bot. **20** (Mém.): 19 (1909); Fl. Kouy-Tchéou, 359 (1915). — Focke in Bibl. Bot. **17** (72¹): 110 (Spec. Rub.) (1910). — Metcalf in Lingnan Sci. Jour. **11**: 7 (1932), pro parte specim. plurim. cit. exclud. — Merrill in Lingnan Sci. Jour. **15**: 420 (1936), specim. cit. excl.

Rubus Lambertianus Ser. var. *paykouangensis* (Lévl.) Handel-Mazzetti, Symb. Sin. **7**: 489 (1933).

CHINA. K w e i c h o u : Pay-kouang, *J. Esquirol*, no. 221, Sept. 1904, "fl. blanches" (holotype; photo. in A. A.).

This species was reduced by Handel-Mazzetti to a variety of *R. Lambertianus*, to which it certainly is more closely related than to the Ser. *Rufi* where Focke placed the species. From *R. Lambertianus* it is easily distinguished by the inflorescence, the stems and petioles being densely covered with pilose and setose partly gland-tipped hairs and by the larger flowers with broader sepals. Metcalf (l.c.) refers to this species a number of specimens from Fukien, Kiangsi and Yunnan which though similar in their indumentum differ markedly in the short often sub-umbellate inflorescence, in the pinnate sepals, in the broader and larger generally orbicular-ovate leaves densely pubescent or even tomentose beneath and in the unarmed branches; they are apparently referable to the Sect. *Moluccani*. Also W. T. Tang, no. 20791, from Kwangtung cited by Merrill (l.c.) under *R. paykouangensis* belongs to that section.

Sect. *Moluccani* Focke

Rubus tephrodes Hance var. *ampliflorus* (Lévl. & Vant.) Handel-Mazzetti, Symb. Sin. **7**: 492 (1933).

Rubus ampliflorus Léveillé & Vaniot in Bull. Soc. Bot. France, **51**: 218

(1904). — Lévêillé in Bull. Acad. Intern. Géog. Bot. 20 (Mém.): 52 (1909); Fl. Kouy-Tchéou, 357 (1915). — Focke in Bibl. Bot. 17 (72¹): 74 (Spec. Rub.) (1910); 19 (83): 28, fig. 6 (Spec. Rub. 252, fig. 93) (1914).

CHINA. K w e i c h o u : Tsin-gai, Tchao-se, *J. Cavalerie*, no. 1201, July 1903, "fl. blanches" (holotype; photo. in A. A.).

Variety *ampliflorus* differs from typical *R. tephrodes* chiefly in the sparingly setose eglandular branches and the very sparingly setose and very large inflorescence about 25 cm. long and 30 cm. wide. Cardot in 1914 (in Not. Syst. Paris, 3: 294) mentions *R. ampliflorus* as being closely related to his new species *R. megalothyrsus* which by Handel-Mazzetti (l.c.) is also referred to *R. tephrodes* as a variety.

Rubus holadenus Lévêillé in Fedde, Rep. Spec. Nov. 12: 536 (1913); Fl. Kouy-Tchéou, 358 (1915).

CHINA. K w e i c h o u : Gan-chouen, alt. 1500 m., *J. Cavalerie*, no. 3948 (holotype; photo. in A. A.).

This species seems to be nearest to *R. tephrodes* Focke, but is readily distinguished by the acuminate calyx, the dark red-brown glabrescent stem and the triangular-ovate, lobulate and acuminate middle lobe of the leaves which are dark-colored above and with dark-colored glabrescent veins beneath.

Rubus calycacanthus Lévêillé in Fedde, Rep. Spec. Nov. 8: 58 (1910); Fl. Kouy-Tchéou, 357 (1915). — Focke in Bibl. Bot. 19 (83): 34 (Spec. Rub. 258) (1914) sub *R. Labbei*. — Cardot in Bull. Mus. Hist. Nat. Paris, 23: 282 (1917). — Handel-Mazzetti, Symb. Sin. 7: 494 (1933).

Rubus calycacanthus var. *Buergerifolia* Lévêillé in Fedde, Rep. Spec. Nov. 8: 58 (1910).

Rubus Labbei Lévêillé & Vaniot in Fedde, Rep. Spec. Nov. 8: 549 (1910). — Lévêillé, Fl. Kouy-Tchéou, 359 (1915). — Focke in Bibl. Bot. 19 (83): 34 (Spec. Rub. 258) (1914).

Rubus Darrisii Lévêillé in Fedde, Rep. Spec. Nov. 12: 188 (1913); Fl. Kouy-Tchéou, 258 (1915). — Focke in Bibl. Bot. 19 (83): 48 (Spec. Rub. 272) (1914). — **Synon. nov.**

CHINA. K w e i c h o u : Tchen-fong, *J. Esquirol*, no. 525, July 1905, "fl. blanche"; without locality, *J. Esquirol*, no. 894 (syntypes of *R. calycacanthus*; photos. in A. A.); without locality, *J. Esquirol*, no. 920; Houa-kiang, *J. Cavalerie*, no. 2175, June 3, 1904 (syntypes of *R. calycacanthus* var. *Buergerifolia*; photos. in A. A.); Lo-fou, *J. Cavalerie*, no. 3575, Aug. 1909, "fl. blanche" (holotype of *R. Labbei*; photo. in A. A.); without locality, *J. Esquirol*, no. 920 (holotype of *R. Darrisii*, photo. in A. A.).

The type specimens of *R. calycacanthus* var. *Buergerifolia* were enumerated by Lévillé in 1915 under the species without citation of the varietal name. *Rubus Labbei* was first identified with *R. calycacanthus* by Cardot in 1917. All the specimens cited above including *R. Darrisii* are undoubtedly conspecific and uniform in their characters. The species is characterized by the short-stalked flowers crowded in short racemes or clusters, subtended by conspicuous bracts finely divided into long subulate segments, the acicular calyx, and the palmately 5-lobed leaves with the middle lobe often somewhat elongated but not acuminate, densely soft pubescent beneath and less so above, petioles and stem tomentose with small scattered hooked prickles.

***Rubus alceaefolius* Poiret**, Encycl. Méth. Bot. 6: 247 (1804) "*alceaefolius*." — Focke in Bibl. Bot. 17 (72¹): 78, fig. 29 (1910).

Rubus Mongouilloni Lévillé & Vaniot in Bull. Acad. Intern. Géog. Bot. 11: 101 (1902); 12 (no. 160): t. 6. (1903); 20 (Mém.): 56 (1909); Fl. Kouy-Tchéou, 359 (1915); in Bull. Soc. Agr. Sci. Arts Sarthe, 45: 219, fig. 6 (Pl. Util. Orn. Kouy-Tchéou, 45, fig. 6) (1915). — Focke in Bibl. Bot. 17 (72¹): 106 (Spec. Rub.) (1910); 19 (83): 30 (Spec. Rub. 254) (1914). — **Synon. nov.**

Rubus fimbriiferus Focke in Bibl. Bot. 17 (72¹): 80 (Spec. Rub.) (1910); 19 (83): 29 (Spec. Rub. 253) (1914). — Cardot in Bull. Mus. Hist. Nat. Paris, 23: 282 (1917); Handel-Mazzetti, Symb. Sin. 7: 494 (1933). — **Synon. nov.**

Rubus multibracteatus var. *Demangei* Lévillé in Fedde, Rep. Spec. Nov. 11: 548 (1913). — **Synon. nov.**

CHINA. K w e i c h o u : sur la route de Huang-kien, Tou-chan, Ou-pao, *J. Cavalerie*, sine no., July 5, 1897 (holotype of *R. Mongouilloni*; photo. in A. A.); Pin-fa, Leao-me-lo, au sud, *J. Cavalerie*, no. 1369, Aug. 1907 (cited under *R. Mongouilloni* in Fl. Kouy-Tchéou; photo. in A. A.).

INDOCHINA. T o n k i n : Hanoi, *V. Demange*, no. 1019, March 25, 1908 (holotype of *R. multibracteatus* var. *Demangei*; photo. in A. A.).

With specimens of *Rubus alceaefolius* from Sumatra, Borneo and Java, the type region of the species, and specimens of *R. fimbriiferus* from southeastern China and Indochina, the type region of that species, and the type specimen and other specimens referred to *R. Mongouilloni* before me, I am unable to find a single constant character or combination of characters to separate these three species. Also Cardot under *R. fimbriiferus* (l.c.) refers to the close affinity of that species to *R. alceaefolius*; he mentions as a distinguishing character the bulbous hairs on the upper surface of the leaf in *R. fimbriiferus*, but there are scattered bulbous hairs on specimens from Sumatra and Borneo and the leaves of the Javanese specimen are as rough and hairy above as those of typical

R. fimbriiferus; among the Chinese material there are specimens, as Chung & Tso 43642 and Tsang 15725 from Hainan, with the leaves nearly smooth above and only slightly pilose. Though the lobes of the leaves in *R. fimbriiferus* are typically rounded, the numerous Chinese specimens show all gradations between rounded and pointed lobes and even the specimen of *R. alceaefolius* figured by Focke (l.c.) has the lobes, at least of the lower leaves, nearly rounded. *Rubus Mongouilloni* and *R. fimbriiferus* were first considered conspecific by Handel-Mazzetti (l.c.) who does not mention *R. alceaefolius* at all, and refers *R. Mongouilloni* as a synonym to *R. fimbriiferus*, though *R. Mongouilloni* has priority. He also states (l.c.) that he is inclined to refer to *R. fimbriiferus* the *R. refractus* Lévl. var. *latifolius* Cardot (in Not. Syst. Paris, 3: 291. 1917) of which he saw at Kew a specimen of the type number, Cavalerie no. 3574, from Kweichou.

Rubus multibracteatus var. *Demangei* is not mentioned by Cardot in his treatment of the genus in Lecomte, Fl. Gén. Indochine, 2: 629–650 (1920), but it is probable that he saw a specimen of Demange no. 1019 and referred it to *R. alceaefolius*, since he states that this species is represented by specimens from numerous localities in Tonkin and Assam.

Rubus multibracteatus Léveillé & Vaniot in Bull. Acad. Intern. Géog. Bot. 11: 99 (1902); 12 (no. 160): t. 5 (1903); 20 (Mém.): 57 (1909); Fl. Kouy-Tchéou, 359 (1915); in Bull. Soc. Agr. Sci. Arts Sarthe, 45: 219, fig. 6 (Pl. Util. Orn. Kouy-Tchéou, 45, fig. 6) (1915). — Focke in Bibl. Bot. 17 (72¹): 103 (Spec. Rub.) (1910). — Cardot in Bull. Mus. Hist. Nat. Paris, 23: 285 (1917), sub *R. mallodes*. — Handel-Mazzetti, Symb. Sin. 7: 496 (1933).

Rubus andropogon Léveillé in Fedde, Rep. Spec. Nov. 8: 58 (Feb. 1910).

Rubus clinocephalus Focke in Bibl. Bot. 17 (72¹): 102, fig. 44 (Spec. Rub.) (1910); 19 (83): 31 (Spec. Rub. 255) (1914). — Léveillé, Fl. Kouy-Tchéou, 357 (1915); Cat. Pl. Yun-Nan, 236 (1917). — Cardot in Bull. Mus. Hist. Nat. Paris, 23: 285 (1917).

Rubus mallodes Focke in Bibl. Bot. 17 (72¹): 104, fig. 45 (1910); 19 (83): 34 (Spec. Rub. 258) (1914). — Cardot in Bull. Mus. Hist. Nat. Paris, 23: 285 (1917).

CHINA. K w e i c h o u : environs de Mou-you-se, *E. Bodinier*, no. 494, July 17, 1900, "fl. blanches" (holotype of *R. multibracteatus*; photo. in A. A.); montagnes, *J. Esquirol*, June 1909 (holotype of *R. andropogon*; photo. in A. A.). Y u n n a n : Mengtze mountains, 6000 ft., *A. Henry*, no. 10293 (erroneously cited by Focke as 10239) "large climber, red fruits, white flowers" (holotype of *R. clinocephalus*; isotype in A. A.).

S z e c h u a n : Min river banks, *E. H. Wilson*, Veitch Exp. no. 3479, June 1903 (holotype of *R. mallodes*; isotype in A. A.).

With the types of *R. multibracteatus* and *R. andropogon* and isotypes of *R. clinocephalus* and *R. mallodes* before me I have no doubt that all four are conspecific. Focke had placed his *R. mallodes* together with *R. multibracteatus* in his series Pacati differing from series Rugosi in the truncate middle lobe of the leaf, but the leaves on the specimens show intergradations between truncate and acute apices and these two species should be referred to the Rugosi, if the two series are maintained at all. *Rubus andropogon* was referred by Focke to *R. clinocephalus* already in 1914 (l.c.), and was enumerated by Lévillé under that species in 1915 (l.c.). *Rubus mallodes* was retained by Cardot in 1917 (l.c.) but in his discussion under that species he states that apparently *R. mallodes* is a synonym of *R. multibracteatus*, and in the same place he recommends the union of the series Rugosi and Pacati. *Rubus clinocephalus* maintained by Cardot as a distinct species was referred as a synonym to *R. multibracteatus* by Handel-Mazzetti in 1933 (l.c.).

Rubus Esquirolii Lévillé in Fedde, Rep. Spec. Nov. 4: 333 (1907); in Bull. Acad. Intern. Géog. Bot. 20 (Mém.): 21 (1909); Fl. Kouy-Tchéou, 358 (1915). — Focke in Bibl. Bot. 17 (72¹): 87 (Spec. Rub.) (1910); 19 (83): 30, 35 (Spec. Rub. 254, 259) (1914).

CHINA. K w e i c h o u : Pin-fa, Niang-ouang, bois humides, *J. Cavalerie*, no. 2351 (holotype; photo. in A. A.).

This species which is represented only by a sterile branch seems to be related to *R. reflexus* Ker, as indicated by Lévillé. It appears closest to var. *Hui* (Diels apud Hu) Metc., but differs in the narrower leaves, ovate in outline with a triangular-ovate gradually acuminate middle lobe, several times longer than the short lateral lobes, in the sharp and close serration, each tooth with a tuft of hairs at the apex, in the longer pilose pubescence of the stem and petioles, and on the veins of the under side of the leaves, and in the more finely and deeply divided bracts.

Rubus setchuenensis Bureau & Franchet in Jour. de Bot. 5: 46 (1891). — Focke in Bibl. Bot. 19 (83): 32 (Spec. Rub. 256) (1914). — Lévillé, Cat. Pl. Yun-Nan, 239 (1917). — Cardot in Bull. Mus. Hist. Nat. Paris, 23: 286 (1917).

Rubus Cavaleriei Lévillé & Vaniot in Bull. Soc. Bot. France, 51: 218 (1904). — Lévillé in Bull. Acad. Intern. Géog. Bot. 20 (Mém.): 22 (1909); Fl. Kouy-Tchéou, 357 (1915). — Focke in Bibl. Bot. 17 (72¹): 104 (Spec. Rub.) (1910); 19 (83): 34 (Spec. Rub. 258) (1914).

CHINA. K w e i c h o u : Pin-fa, bords des ruisseaux, *J. Cavalerie*,

no. 1125, July 10, 1903, "fl. blanches rosées" (holotype of *R. Cavaleriei*; photo. in A. A.).

Rubus Cavaleriei was first identified with *R. setchuenensis* by Cardot (l.c.) who also refers *R. clemens* Focke and *R. Schindleri* Focke to that species.

Rubus Lyi Léveillé in Fedde, Rep. Spec. Nov. 12: 536 (1913); Fl. Kouy-Tchéou, 359 (1915).

CHINA. K w e i c h o u : Gan-chouen, *J. Cavalerie*, no. 3945 (holotype; photo. in A. A.).

This species seems closely related to *R. setchuenensis*, but the lobes of the leaves are almost triangular-ovate, acute or short-acuminate, more sharply serrate and lobulate, the under side is covered with a villous less close tomentum and only slightly reticulate, the petioles bear a few small prickles and the bracts are less deeply divided; the inflorescence does not differ except that it usually bears two small suborbicular leaves at the base and the flowers are slightly smaller.

Rubus Feddei Léveillé & Vaniot in Fedde, Rep. Spec. Nov. 8: 549 (1910); Fl. Kouy-Tchéou, 358 (1915). — Focke in Bibl. Bot. 19 (83): 27 (Spec. Rub. 251) (1914). — Cardot in Bull. Mus. Hist. Nat. Paris, 23: 286 (1917).

CHINA. K w e i c h o u : Lo-fou, *J. Cavalerie*, no. 3576, March 1909 (holotype; photo. in A. A.).

By Focke this *Rubus* is referred to his Sect. *Elongati* on account of its large paniculate inflorescence, but Cardot (l.c.) prefers to place it in the Sect. *Moluccani* Ser. *Rufi* chiefly because of the presence of long pilose partly glandular hairs on the inflorescence, stems and petioles, and characterizes two of his new species of this series from Tonkin, *R. Lecomtei* and *R. polyadenus* (in Not. Syst. Paris, 3: 302, 303), by comparison with *R. Feddei*.

Rubus amphidasys Focke in Bot. Jahrb. 29: 396 (1901); in Bibl. Bot. 17 (72¹): 108 (Spec. Rub.) (1910). — Handel-Mazzetti, Symb. Sin. 7: 485 (1933).

Rubus Chaffanjonii Léveillé & Vaniot in Bull. Acad. Intern. Géog. Bot. 11: 98 (1902); 12 (no. 160): f. 2 (1903). — Léveillé in op. cit. 20 (Mém.): 20 (1909); Fl. Kouy-Tchéou, 360 (1915); in Bull. Soc. Agr. Sci. Arts Sarthe, 45: 219, fig. 5 (Pl. Util. Orn. Kouy-Tchéou, 45, fig. 5) (1915). — Focke in Bibl. Bot. 17 (72¹): 118 (Spec. Rub.) (1910); 19 (83): 34 (Spec. Rub. 258) (1914). — Cardot in Not. Syst. Paris, 3: 290 (1917) sub *R. ourosepalus*; in Bull. Mus. Hist. Nat. Paris, 23: 275 (1917).

CHINA. K w e i c h o u : environs de Kouy-yang, mont du Col-

lège, gorges Yang-pa, *J. Chaffanjon*, no. 240, June 1898 (holotype of *R. Chaffanjoni*; photo. in A. A.).

Cardot doubts the identity of *R. Chaffanjoni* with *R. amphidasys*, but I agree with Handel-Mazzetti that they are conspecific, which is also the opinion of Focke who erroneously makes in 1914 his species a synonym of *R. Chaffanjoni* having cited the date of publication of the letter as of 1899.

Rubus hastifolius Léveillé & Vaniot in Bull. Soc. Bot. France, **51**: 218 (1904). — Léveillé in Bull. Acad. Intern. Géog. Bot. **20** (Mém.): 28 (1909); Fl. Kouy-Tchéou, 358 (1915). — Focke in Bibl. Bot. **17** (72^I): 107 (Spec. Rub.) (1910); **19** (83): 35 (Spec. Rub. 259) (1914). — Cardot in Bull. Mus. Hist. Nat. Paris, **23**: 288 (1917).

CHINA. K w e i c h o u : Pin-fa, route de Tou-chan, *J. Cavalerie*, no. 1255, March 19, 1903, "fl. blanches" (holotype; photo. in A. A.).

This species is related to *R. flagelliflorus* Focke, but easily distinguished from all species of this group by its oblong-lanceolate sub-panduriform leaves.

Rubus sino-Sudrei Léveillé in Bull. Acad. Intern. Géog. Bot. **24**: 251 (1914); Fl. Kouy-Tchéou, 360 (1915); Cat. Pl. Yun-Nan, 341, fig. 61 (1917).

CHINA. K w e i c h o u : enfoncement de Ouang-ly, *J. Esquirol*, no. 3506, March 1912, "couleur blanche" (holotype; photo. in A. A.).

Léveillé compares this species with *R. philyrinus* Focke to which it bears a close resemblance in habit and leaf-shape, but in that species the indumentum is tomentose-villous, while in *R. sino-Sudrei* the stem and the petioles are glabrous or nearly so and the under side of the leaves is closely tomentulose with appressed-pilose veins, and the teeth are terminated by a distinct conical gland.

Rubus irenaeus Focke in Bot. Jahrb. **29**: 394 (1901); in Bibl. Bot. **17** (72^I): 114 (Spec. Rub.) (1910); **83**: 35 (Spec. Rub. 259) (1914). — Léveillé, Fl. Kouy-Tchéou, 360 (1915). — Cardot in Bull. Mus. Hist. Nat. Paris, **23**: 289 (1917).

Rubus Jamini Léveillé & Vaniot in Bull. Acad. Intern. Géog. Bot. **11**: 102 (1902); **12** (no. 160): fig. 7 (1903). — Léveillé in op. cit. **20** (Mém.): 52 (1909); Fl. Kouy-Tchéou, 358 (1915). — Focke in Bibl. Bot. **17** (72^I): 114 (Spec. Rub.) (1910).

CHINA. K w e i c h o u : environs de Kouy-yang, bois de Kien-lin-chan, *E. Bodinier*, no. 2368, June 10, 1898, "fl. jaunes" (holotype of *R. Jamini*; photo. in A. A.).

Rubus Jamini was first identified with *R. irenaeus* by Focke in 1914

and this identification was recorded by L  veill   the following year (l.c. 360). The species is represented from Kweichou in this herbarium also by specimens collected by Y. Tsiang (nos. 4193, 5815).

Rubus Buergeri Miquel in Ann. Mus. Bot. Lugd.-Bat. **3**: 36 (Prol. Fl. Jap. 224) (1867). — Cardot in Bull. Mus. Hist. Nat. Paris, **23**: 288 (1917). — Handel-Mazzetti, Symb. Sin. **7**: 497 (1933).

Rubus Bodinieri L  veill   & Vaniot in Bull. Acad. Intern. G  og. Bot. **11**: 97 (1902); **12** (no. 160): t. 1 (1903). — L  veill   in op. cit. **20** (M  m.): 58 (1909). — L  veill  , Fl. Kouy-Tch  ou, 357 (1915); in Bull. Soc. Agr. Sci. Arts Sarthe, **45**: 219, fig. 4 (Pl. Util. Orn. Kouy-Tch  ou, 45, fig. 4) (1915). — Focke in Bibl. Bot. **17** (72^{II}): 116 (Spec. Rub.) (1910). — Cardot in Not. Syst. Paris, **3**: 297 (1916), sub *R. dolichocladus*. — Handel-Mazzetti, Symb. Sin. **7**: 497 (1933), sub *R. dolichocladus* Cardot. — **Synon. nov.**

CHINA. Kweichou: Mont du Coll  ge, dans les herbes, *E. Bodinier*, July 20, 1898, "fl. blanches" (holotype of *R. Bodinieri*; photo. in A. A.).

It does not seem possible to separate *R. Bodinieri* by any reliable character from *R. Buergeri* except that the flowers, bracts and stipules are smaller and the calyx more closely pubescent. In the pubescence of the leaves it is near *R. Buergeri* var. *viridifolius* Handel-Mazzetti (l.c.) and perhaps referable to that variety. Specimens from Kweichou very similar to Bodinier's specimen are Y. Tsiang's nos. 5995 and 4412, the latter in fruit. Also Cardot in 1917 (l.c.) cites specimens of *R. Buergeri* from Kweichou.

Rubus Blinii L  veill   in Fedde, Rep. Spec. Nov. **7**: 258 (1909); in Bull. Acad. Intern. G  og. Bot. **20** (M  m.): 112 (1909); Fl. Kouy-Tch  ou, 357 (1915). — Focke in Bibl. Bot. **19** (83): 35, 36 (Spec. Rub. 260) (1914).

CHINA. Kweichou: Pin-fa, bois, *J. Cavalerie*, no. 3307, Nov. 1907, "fruits rouges" (holotype; photo. in A. A.).

This species which was compared by L  veill   with his *R. Monguilloni* (= *R. fimbriifolius* Focke) is apparently most nearly related to *R. pacificus* Hance from which it chiefly differs in the spreading pilose pubescence of the calyx and in the exserted styles.

Subgen. IDAEOBATUS Focke

Sect. Corchorifolii Focke

Rubus corchorifolius Linn   f., Suppl. 263 (1781). — L  veill   in Bull. Acad. Intern. G  og. Bot. **20** (M  m.): 65, 125 (1909); Fl. Kouy-Tch  ou, 358 (1915); Cat. Pl. Yun-Nan, 236 (1917). — Focke in Bibl.

Bot. 17 (72^{II}): 131 (1911). — Cardot in Bull. Mus. Hist. Nat. Paris, 23: 289 (1917). — Nakai, Fl. Sylv. Kor. 7: 55, t. 20 (1918).

Rubus kerriifolius Léveillé & Vaniot in Bull. Acad. Intern. Géog. Bot. 11: 100 (1902). — Léveillé in Bull. Acad. Intern. Géog. Bot. 20 (Mém.): 27 (1909).

Rubus Vanioti Léveillé in Fedde, Rep. Spec. Nov. 5: 280 (1908); in Bull. Acad. Intern. Géog. Bot. 20 (Mém.): 31 (1909).

CHINA. K w e i c h o u : environs de Kouy-yang, commun dans les montagnes, E. Bodinier, no. 2072^{bis}, March 14, 1898, "donnant des baies excellentes, à goût de framboise" (holotype of *R. kerriifolius*; photo. in A. A.).

KOREA. Q u e l p a e r t : in sepibus prope Hong-no, U. Faurie, no. 1577, June 1907 (holotypes of *R. Vanioti*; isotype in A. A.).

Rubus kerriifolius and *R. Vanioti* were first identified with *R. corchorifolius* by Focke (l.c.), and his identification was accepted by Léveillé who cites the type of *R. kerriifolius* in 1915 under *R. corchorifolius*, though without quoting his name as a synonym, but in 1917 (l.c.) he cites it as a synonym of *R. corchorifolius*. In Herb. California University there is a specimen of Ducloux no. 639 from Yunnan labeled in Léveillé's handwriting *R. kerriifolius*.

Rubus Fauriei Léveillé & Vaniot in Bull. Soc. Agr. Sci. Arts Sarthe, 40: 60 (1905); in Fedde, Rep. Spec. Nov. 2: 174 (1906); in Bull. Acad. Intern. Géog. Bot. 20 (Mém.): 126 (1909). — Koidzumi in Jour. Coll. Sci. Tokyo, 34 (art. 2): 148 (1913). — Focke in Bibl. Bot. 17 (72^{II}): 132 (Spec. Rub.) (1911). — Makino & Nemoto, Nippon-shokubutsu-sôran, ed. 2, p. 512 (1931).

JAPAN. H o n d o : Tottori, U. Faurie, no. 3172, May 22, 1899 (holotype; photo. in A. A.).

This is a distinct species with its large 3-lobed or sometimes undivided lobulate leaves and solitary large flowers on short lateral branchlets bearing one or two leaves.

Rubus crataegifolius Bunge in Mém. Div. Sav. Acad. Sci. St. Pétersb. 2: 98 (Enum. Pl. Chin. Bor. 24) (1833). — Léveillé in Bull. Acad. Intern. Géog. Bot. 20 (Mém.): 39, 127 (1909). — Focke in Bibl. Bot. 17 (72^{II}): 137 (Spec. Rub.) (1911). — Koidzumi in Jour. Coll. Sci. Tokyo, 34 (art. 2): 125 (1913). — Cardot in Bull. Mus. Hist. Nat. Paris, 23: 290 (1917). — Nakai, Fl. Sylv. Kor. 7: 57, t. 21 (1918).

Koidzumi, Cardot and Nakai refer to *R. crataegifolius* without distinguishing varieties, the following species of Léveillé: *R. makinoensis*, *R. itoensis*, *R. ouensanensis* and *R. ampelophyllus*, but these species seem to differ sufficiently from typical *R. crataegifolius* as represented by

specimens from Hopei that at least the two following forms may be distinguished.

Rubus crataegifolius f. Makinoensis (Lévl. & Vant.) Koidzumi in Jour. Coll. Sci. Tokyo, **34** (art. 2): 125 (1913). — Makino & Tanaka, Man. Fl. Nippon, 254 (1929).

Rubus Makinoensis Léveillé & Vaniot in Bull. Soc. Agr. Sci. Arts Sarthe, **40**: 60 (1905); in Fedde, Rep. Spec. Nov. **2**: 174 (1906). — Léveillé in Bull. Acad. Intern. Géog. Bot. **20** (Mém.): 125 (1909). — Focke in Bibl. Bot. **17** (72^{II}): 135 (1911); **19** (83): 36 (Spec. Rub. 260) (1914).

Rubus ampelophyllus Léveillé in Fedde, Rep. Spec. Nov. **5**: 279 (1908); in Bull. Acad. Intern. Géog. Bot. **20** (Mém.): 49 (1909). — Focke in Bibl. Bot. **17** (72^{II}): 135 (Spec. Rub.) (1911). — Cardot in Bull. Mus. Hist. Nat. Paris, **23**: 290 (1917).

Rubus erectifolius Léveillé in litt. ex Nakai, Fl. Sylv. Kor. **7**: 57 (1918) pro synonym. *R. crataegifolii*.

Rubus suberectifolius Léveillé in litt. ex Nakai, l.c., pro synonym. *R. crataegifolii*.

Rubus Wrightii A. Gray var. *makinoensis* (Lévl. & Vant.) Koidzumi in Bot. Mag. Tokyo, **43**: 391 (1929). — Makino & Nemoto, Nippon-shokubutsu-sôran, ed. 2, p. 527 (1931), "*Makinoensis*."

Rubus Wrightii A. Gray var. *ampelophyllus* (Lévl.) Koidzumi l.c. (1929). — Makino & Nemoto, l.c. (1931).

JAPAN. H o n d o : circa Kopu, *U. Faurie*, no. 5369, July 1903 (holotype of *R. Makinoensis*; isotype in A. A.).

KOREA. Q u e l p a e r t : *U. Faurie* (holotype of *R. ampelophyllus*; ex Léveillé). K o g e n d o p r o v i n c e : in monte des diamants, *U. Faurie*, no. 302, June 1906 (in herb. Léveillé sub *R. ampelophyllus*; photo. in A. A.).

This form differs from typical *R. crataegifolius* in the large leaves pubescent on the veins beneath, in the larger flowers with narrower long-acuminate sepals, pilose outside and in the pubescent inflorescence; in *R. ampelophyllus* the pubescence is slighter, but otherwise it agrees with the type of *R. Makinoensis*. Léveillé describes the calyx of *R. ampelophyllus* as "extus . . . glabra" and so is the calyx of a detached flower in the pocket on the sheet of no. 302, but the flowers on the specimen itself have the same pubescence as *R. Makinoensis* but slighter.

Rubus crataegifolius f. itoensis (Lévl. & Vant.) Koidzumi in Jour. Coll. Sci. Tokyo, **34** (art. 2): 125 (1913). — Makino & Tanaka, Man. Fl. Nippon, 254 (1929).

? *Rubus crataegifolius* f. *minor* Kuntze, Meth. Spec. Rubus, 95 (1879). — Makino & Tanaka, l.c. (1929).

Rubus itoensis Léveillé & Vaniot in Bull. Soc. Agr. Sci. Arts Sarthe,

40: 62 (1905); in Fedde, Rep. Spec. Nov. 2: 175 (1906). — Focke in Bibl. Bot. 17 (72^{II}): 135, fig. 57 (Spec. Rub.) (1911).

Rubus ouensanensis Léveillé & Vaniot in Bull. Soc. Agr. Sci. Arts Sarthe, 40: 62 (1905); in Fedde, Rep. Spec. Nov. 2: 275 (1906); in Bull. Acad. Intern. Géog. Bot. 20 (Mém.): 67 (1909). — Focke in Bibl. Bot. 17 (72^{II}): 137 (Spec. Rub.) (1911).

Rubus Wrightii A. Gray var. *ouensanensis* (Lévl. & Vant.) Koidzumi in Bot. Mag. Tokyo, 43: 391 (1929).

JAPAN. H o n d o : Kiushu, circa Takeo, *U. Faurie*, no. 5365, July 23, 1903 (holotype of *R. itoensis*; isotype in A. A.).

KOREA: Ouen-san, in collibus, *U. Faurie*, no. 33, July 1901 (holotype of *R. ouensanensis*; photo. in A. A.).

This form differs from the preceding in its much smaller leaves which resemble those of the following species, but the inflorescence and flowers are those of *R. crataegifolius*. *Rubus ouensanensis* is referred to *f. itoensis* with some doubt; it differs in the leaves being nearly glabrous and somewhat larger, in the very sparingly armed stem, and in the rather dense but evanescent pubescence of the calyx.

Rubus incisus Thunberg, Fl. Jap. 217 (1784). — Léveillé & Vaniot in Bull. Acad. Intern. Géog. Bot. 20 (Mém.): 38, 128 (1909). — Focke in Bibl. Bot. 17 (72^{II}): 138, fig. 58 (Spec. Rub.) (1911). — Cardot in Bull. Mus. Hist. Nat. Paris, 23: 291 (1917).

Rubus Grossularia Léveillé & Vaniot in Bull. Soc. Agr. Sci. Arts Sarthe, 40: 61 (1905); in Fedde, Rep. Spec. Nov. 2: 175 (1906). — Léveillé in Bull. Acad. Intern. Géog. Bot. 20 (Mém.): 128 (1909).

Rubus incisus Thunb. α *proprius* subvar. *b. geifolius* (O. Ktze.) Koidzumi in Jour. Coll. Sci. Tokyo, 34 (art. 2): 122 (1913).

JAPAN. H o n d o : circa Kobe, *U. Faurie*, no. 5368, April 13, 1903 (holotype of *R. Grossularia*; isotype and photo. in A. A.).

Rubus Grossularia was first identified with *R. incisus* by Focke (l.c.). Koidzumi (l.c.) distinguishes under var. *proprius* the subvarieties *a. geifolius* and *b. euincisus* and refers *R. Grossularia* as a synonym to the first, but they seem to be too closely connected by intermediate forms to be kept distinct. The following variety is more distinct and usually easily separated by its much larger 3-lobed and often rather deeply 3-lobed leaves with acute or acuminate middle lobe.

Rubus incisus Thunb. var. *subcrataegifolius* (Lévl. & Vant.), comb. nov.

Rubus crataegifolius Bunge var. *subcrataegifolius* Léveillé & Vaniot in Bull. Soc. Agr. Sci. Sarthe, 40: 61 (1905); in Fedde, Rep. Spec. Nov. 2: 174 (1906). — Focke in Bibl. Bot. 17 (72^{II}): 137 (Spec. Rub.) (1911).

Rubus subcrataegifolius (Lévl. & Vant.) Lévillé in Bull. Acad. Intern. Géog. Bot. **20** (Mém.): 127 (1909).

Rubus Koehneanus Focke, op. cit. 140, fig. 60 (1911). — **Synon. nov.**

Rubus incisus Thunb. α *proprius* subvar. *c. Koehneanus* (Focke) Koidzumi in Jour. Coll. Sci. Tokyo, **34** (art. 2): 122 (1913).

JAPAN. H o n d o : Jizogatake, *U. Faurie*, no. 5370, July 1903; Asama, *U. Faurie*, no. 6074, July 1904 (syntypes of *R. crataegifolius* var. *subcrataegifolius*; isotypes in A. A.).

Cardot (in Bull. Mus. Hist. Nat. Paris, **23**: 290) and Koidzumi (in Jour. Coll. Sci. Tokyo, **34** (art. 2): 125) refer *R. subcrataegifolius* as a synonym to *R. crataegifolius*; in its foliage it resembles somewhat its var. *itoensis*, but flowers and inflorescence are clearly those of *R. incisus*.

Section Leucanthi Focke

Rubus Delavayi Franchet, Pl. Delavay. 205 (1890). — Focke in Bibl. Bot. **17** (72^{II}): 148 (Spec. Rub.) (1911). — Lévillé, Cat. Pl. Yun-Nan, 236 (1917). — Cardot in Bull. Mus. Hist. Nat. Paris, **23**: 274 (1917).

Rubus Duclouxii Lévillé in Fedde, Rep. Spec. Nov. **6**: 111 (1908); in Bull. Acad. Intern. Géog. Bot. **20** (Mém.): 80 (1909).

CHINA. Y u n n a n : mont Tchong-chan, *F. Ducloux*, no. 622, Aug. 1, 1906, "fl. blanches" (holotype of *R. Duclouxii*; photo. of the type, and of an isotype in Herb. Univ. Calif. in A. A.).

Rubus Duclouxii was referred as a synonym to *R. Delavayi* by Focke in 1911 (l.c.). Cardot (l.c.) refers this species to the subgen. *Cylactis*.

Sect. Rosaefolii

Rubus alnifoliolatus Lévillé in Bull. Soc. Bot. France, **53**: 549 (1906); in Bull. Acad. Intern. Géog. Bot. **20** (Mém.): 77 (1909). — Focke in Bibl. Bot. **17** (72^{II}): 152 (Spec. Rub.) (1911). — Koidzumi in Jour. Coll. Sci. Tokyo, **34** (art. 2): 150 (1913). — Cardot in Bull. Mus. Hist. Nat. Paris, **23**: 294 (1917).

FORMOSA: in petrosis Kushaku, *U. Faurie*, no. 132, June 8, 1903 (holotype; photo. in A. A.).

Closely related to *R. fraxinifolius* Poir., but differing chiefly in its oblong, acute or obtusish, not acuminate leaflets.

Rubus minusculus Lévillé & Vaniot in Bull. Soc. Agr. Sci. Arts Sarthe, **40**: 63 (1905). — Lévillé in Bull. Acad. Intern. Géog. Bot. **20** (Mém.): 129 (1909). — Focke in Bibl. Bot. **17** (72^I): 29 (Spec. Rub.) (1910); **19** (83): 18, fig. 1 (Spec. Rub. 242, fig. 88) (1914). — Cardot in Bull. Mus. Hist. Nat. Paris, **23**: 295 (1917).

Rubus rosaefolius α *tropicus* l. *minor* Makino in Bot. Mag. Tokyo, 15: 50 (1901). — Makino & Tanaka, Man. Fl. Nippon, 254 (1927). — Makino & Nemoto, Nippon-shokubutsu-sôran, ed. 2, p. 524 (1931).

Rubus succedaneus Nakai & Koidzumi in Bot. Mag. Tokyo, 25: 260 (1911).

JAPAN. H o n d o : prope Nara, *U. Faurie*, no. 3187, May 16, 1899 (holotype; photo. in A. A.).

This species has been placed by Focke in the subgen. *Cylactis* on account of its diminutive stature, but I agree with Cardot, that it is more closely related to *R. rosaefolius* Sm. and may represent a depauperate form of it; as such it was described by Makino (l.c.). Makino & Nemoto in 1931 (l.c.) cite *R. minusculus* as a synonym of *R. rosaefolius* α *tropicus* l. *minor*.

A variety, *R. minusculus* var. *yakusimensis*, was described by Masumune (Prel. Rep. Veg. Yak. 83. 1929), and later elevated to specific rank: *R. yakusimensis* Masumune in Mem. Fac. Sci. Agr. Taihoku Imp. Univ. Bot. 4: 234 (1934).

Rubus croceacanthus Lévêillé in Fedde, Rep. Spec. Nov. 11: 33 (1912) "*croceacantha*." — Nakai, Rep. Veg. Quelpaert, 53 (1914); in Bot. Mag. Tokyo, 30: 223 (1916); Fl. Sylv. Kor. 7: 64, t. 24 (1918). — Mori, Enum. Pl. Corea, 204 (1922). — Koidzumi, Fl. Symb. Or. As. 65 (1930).

KOREA. Q u e l p a e r t : in sepibus et silvis Setchimeri, *E. Taquet*, nos. 5554, 5555, 5556, 5557, May 1911 (syntypes; photos. of 5554 and 5557 in A. A.).

This species seems closely related to *R. rosaefolius* Sm., but is easily distinguished by the gland-tipped setae on the branchlets, petioles and calyces. It may be only a variety of the latter. The two seem to be connected by intermediate forms, as two specimens from Kwangsi collected by Steward & Cheo show, one of them, no. 192, being rather densely stipitate-glandular, while the other, no. 338 from the same region, is nearly glabrous.

Rubus marmoratus Lévêillé & Vaniot in Bull. Soc. Agr. Sci. Arts Sarthe, 40: 64 (1905); in Fedde, Rep. Spec. Nov. 2: 275 (1906). — Lévêillé in Bull. Acad. Intern. Géog. Bot. 20 (Mém.): 131 (1909). — Focke in Bibl. Bot. 17 (72^{II}): 156 (Spec. Rub.) (1911). — Koidzumi in Jour. Coll. Sci. Tokyo, 34 (art. 2): 150 (1913). — Makino & Nemoto, Nippon-shokubutsu-sôran, ed. 2, p. 517 (1931).

JAPAN. H o n d o : Jizogatake, *U. Faurie*, no. 5373, July 1903 (holotype; photo. in A. A.).

This species has been compared with *R. rosaeifolius* Sm., but all the leaves except one are 3-foliate, the plant is glabrous and unarmed except a few minute prickles on the young branchlets and petioles, and there are 2-4 very young flower buds at the end of the not yet fully grown lateral branchlets.

Rubus sumatranus Miquel, Fl. Ind. Bot. Suppl. 307 (1860-61). — Merrill in Contrib. Arnold Arb. 8: 70 (1934).

Rubus myriadenus Léveillé & Vaniot in Bull. Soc. Bot. France, 51: 218 (1904). — Léveillé in Bull. Acad. Intern. Géog. Bot. 20 (Mém.): 81 (1909). — Nakai in Bot. Mag. Tokyo, 30: 223 (1916); Fl. Sylv. Kor. 7: 62 t. 22, fig. c (1918). — Mori, Enum. Pl. Corea, 205 (1922).

Rubus myriadenus var. *grandifoliolatus* Léveillé in Fedde, Rep. Spec. Nov. 4: 334 (1907); in Bull. Acad. Intern. Géog. Bot. 20 (Mém.): 81 (1909).

Rubus rosaeifolius Sm. subsp. *sumatranus* (Miq.) Focke in Bibl. Bot. 17 (72^{II}): 155 (Spec. Rub.) (1911).

Rubus asper Focke in Bibl. Bot. 17 (72^{II}): 157 (Spec. Rub.) (1911). — Léveillé, Fl. Kouy-Tchéou, 357 (1915). — Nakai in Bot. Mag. Tokyo, 30: 222 (1916); Fl. Sylv. Kor. 7: 61, t. 22, fig. a, b (1918). — Non D. Don.

Rubus asper var. (subspec. ?) *myriadenus* Focke in Bibl. Bot. 17 (72^{II}): 158 (Spec. Rub.) (1911). — Léveillé, Cat. Pl. Yun-Nan, 236 (1917), as var.

Rubus asper var. (subspec. ?) *myriadenus* subvar. *grandifoliolatus* (Lévl.) Focke in Bibl. Bot. 17 (72^{II}): 158 (Spec. Rub.) (1911).

CHINA. K w e i c h o u : Pin-fa, Youin-ou-chan, *J. Cavalerie*, no. 60, July 15, 1902, "fl. blanches" (holotype of *R. myriadenus*; photo. in A. A.); without locality, *J. Esquirol*, no. 460, May 1905 (holotype of *R. myriadenus* var. *grandifoliolatus*; photo. in A. A.); Kiao-ran, *J. Esquirol*, no. 354, April 3, 1905 (cited in Fl. Kouy-Tchéou sub *R. asper*).

Merrill has pointed out (l.c.) that the plant referred by recent authors to *R. asper* D. Don differs from that species markedly in the copious setose gland-tipped hairs up to 4 mm. long equalling the prickles in length, while *R. asper* has short scattered glandular-capitate hairs 1 mm. long or less, and he identifies the former with *R. sumatranus* Miq. Focke (l.c.) enumerates *R. sumatranus* as a subspecies of *R. rosaeifolius* Sm. and apparently by mistake cites the name also as a synonym of *R. piriifolius* Sm. (op. cit. p. 64).

The orange yellow fruits are sweet and of good flavor according to a note on W. N. & C. M. Bangham's no. 1121 from Sumatra. According to Nakai the fruits of *R. myriadenus* are white and insipid.

Rubus myriadenus was referred as a synonym to *R. asper* by Léveillé

himself in 1914, but in 1917 he enumerates it as a variety of *R. asper*. Nakai in 1918 (l.c.) still maintained it as a distinct species, but cites in 1916 and 1918 two varietal manuscript names of Lévillé under *R. asper*, namely: "*R. myriadenus* v. *minor*, Lévl. in litt. fide Faurie. Nakai Veg. Isl. Wang. p. 8" and *R. myriadenus* var. *microcarpa*, Lévl. in litt. fide Taquet"; I have seen no specimens so named of either one.

It does not seem advisable to maintain *R. myriadenus* and its var. *grandifoliolatus* as varieties or even as forms. I can find no difference in the inflorescence, nor is the fruit of the type specimen of *R. myriadenus* elliptic, as Nakai describes the fruit of that species; var. *grandifoliolatus* differs only in the larger leaflets but grades imperceptibly into the more common smaller-leaved form, if one compares a large series of specimens of this widely distributed species.

Rubus Thunbergii Siebold & Zuccarini in Abh. Math. Phys. Kl. Akad. Muench. 4: 246 (1844). — Focke in Bibl. Bot. 17 (72^{II}): 158 (Spec. Rub.) (1911). — Nakai, Fl. Sylv. Kor. 7: 63, t. 23 (1918).

Rubus Argyi Lévillé in Fedde, Rep. Spec. Nov. 4: 333 (1907); in Bull. Acad. Intern. Géog. Bot. 20 (Mém.): 105 (1909).

Rubus talaikiaensis Lévillé in Fedde, Rep. Spec. Nov. 4: 334 (1907); in Bull. Acad. Intern. Géog. Bot. 20 (Mém.): 105 (1909).

Rubus stephanandria Lévillé in Fedde, Rep. Spec. Nov. 8: 358 (1910). — Focke in Bibl. Bot. 19 (83): 40 (Spec. Rub. 264) (1914).

Rubus Thunbergii var. *R. Argyi* (Lévl.) Focke in Bibl. Bot. 17 (72^{II}): 160 (Spec. Rub.) (1911).

Rubus Thunbergii var. *R. talaikiensis* (Lévl.) Focke, l.c. (1911).

Rubus Thunbergii var. *Argyi* (Lévl.) Lévillé in Mem. Acad. Ci. Art. Barcelona, ser. 3, 12: 560 (Cat. Pl. Kiang-Sou, 20) (1916).

Rubus Thunbergii var. *talaikiensis* (Lévl.) Lévillé, l.c. (1916).

Rubus hirsutus Thunberg, Diss. Bot.-Med. de Rubo, 7, 10 (1813), nom. dub. — Koidzumi in Bot. Mag. Tokyo, 39: 306 (1925). — Nakai in Bot. Mag. Tokyo, 44: 525 (1930).

Rubus hirsutus Thunb. var. *Argyi* (Lévl.) Nakai in Bot. Mag. Tokyo, 44: 526 (1930).

KOREA. *Quelpaert*:* in sylvis Hallaisan, alt. 500 m., *E. Taquet*, no. 2829, May, 1909; in sepibus Hogno, rara, *E. Taquet*, no. 2850, May 1909 (syntypes of *R. stephanandria*; isotypes in A. A.).

CHINA. *Kiangsu*: montagnes Tchu-chan, Zuo-se, Song-kiang-fou, *d'Argy*, May [1846-66] (holotype of *R. Argyi*; photo. in A. A.); Souo-se, Talai-kiao, *d'Argy*, May [1846-66] (holotype of *R. talaikiaensis*; photo. in A. A.).

Rubus Argyi and *R. Talaikiaensis* were referred by Focke in 1911 as varieties to *R. Thunbergii*, but without varietal combinations which

were published by L  veill   in 1916. *Rubus stephanandria* was cited as a synonym of *R. hirsutus* Thunb. (*R. Thunbergii* Sieb. & Zucc.) by Nakai in 1930. In the same publication Nakai enumerates *R. eustephanos* Focke, *R. Argyi* and *R. talaikiaensis* L  vl. as synonyms of *R. hirsutus*, but his description "rami et folia glabra" certainly does not apply to the two L  veill   species.

I hesitate to follow Koidzumi and Nakai in adopting *Rubus hirsutus* Thunb. as the oldest name for *R. Thunbergii*. The description given by Thunberg "foliis pinnatis hirsutis, caule, inermi, petiolis aculeatis" is certainly inadequate and also misleading in so far as the species is placed together with *R. rosaeifolius* and *R. niveus* under the group "foliis pinnatis" as contrasted with the preceding group "foliis quinatis." Though the name, *R. hirsutus*, apparently represents a new species, it does not figure under "Descriptio specierum novarum" where fuller descriptions of several new species are given. Nakai's discussion in 1930 seems to infer that Thunberg himself placed his *R. caesi  s* later with *R. hirsutus*, but in his Dissertatio (p. 10) he cites under the Japanese species *R. hirsutus* as well as *R. caesi  s*. That Thunberg's types of both these species which I have seen in Upsala, and of which I have photographs before me, belong to *R. Thunbergii* I have little doubt, though *R. hirsutus* is represented only by a sterile shoot with 5-foliolate leaves; *R. caesi  s* is well represented by flowering branches, which agree with *R. Thunbergii*. Neither Koidzumi nor Nakai mention *R. idaeus* Thunb. which is cited by Siebold & Zuccarini as a synonym of *R. Thunbergii*.

Whether *R. hirsutus* Thunb. is accepted or rejected, it will preclude the use of the later synonyms, *R. hirsutus* Wirtg. (1841) or *R. hirsutus* Wimm. (1857) for any of these species of the subgen. Eubatus.

Rubus micranthus D. Don, Prodr. Fl. Nepal. 235 (1825). — Focke in Bibl. Bot. 17 (72^{II}): 184, fig. 75 (1911). — L  veill  , Cat. Pl. Yun-Nan, 239 (1917).

Rubus lasiocarpus Sm. var. *micranthus* Hook. f., Fl. Brit. Ind. 2: 339 (1878). — Cardot in Bull. Mus. Hist. Nat. Paris, 23: 301 (1917). *Rubus Pyi* L  veill   in Fedde, Rep. Spec. Nov. 6: 111 (1908); in Bull. Acad. Intern. G  og. Bot. 20 (M  m.): 72 (1909). — Focke in Bibl. Bot. 17 (72^I): 30 (1910).

CHINA. Y u n n a n : Yun-nan-sen, vallons du Tchong-chan, F. Ducloux, no. 638, Apr. 20, 1904 (holotype of *R. Pyi*; isotype in Herb. Univ. Calif.; photo. in A. A.).

Rubus Pyi was identified with *R. micranthus* by Focke in 1911.

Rubus tongchouanensis L  veill   in Fedde, Rep. Spec. Nov. 12: 283

(1913); Cat. Pl. Yun-Nan, 242 (1917). — Focke in Bibl. Bot. 19 (83): 264 (Spec. Rub. 3: 488) (1914).

CHINA. Y u n n a n : haies, plaine de Tong-chouan, alt. 2500 m., E. E. Maire, June 1912, "épineux grim pant, fl. roses, fruits rouges" (holotype; photo. in A. A.).

This species is apparently closely related to *R. micranthus* Don and *R. niveus* Thunb., but is easily distinguished by its 5-foliolate leaves, those below the inflorescence 3-foliolate or even simple, by the ovate or elliptic-ovate acute to obtusish leaflets, the terminal rounded or subcordate at base and sometimes slightly 3-lobed, more finely and somewhat doubly serrulate, with very short often rounded mucronulate teeth, by the appressed-pubescent petioles and branchlets, and by the slender-peduncled inflorescences in the axils of the leaves. To this species also belongs no. 408 in herb. Bonati, collected by E. E. Maire, May 1905, without locality except "rochers"; this specimen is named *R. Pyi* Lévl. in Léveillé's handwriting, but agrees exactly with the type of *R. tongchouanensis*; it is not cited by Léveillé. Here also belongs Maire's specimen distributed by the Arnold Arboretum under no. 162 as *R. micranthus*; the label agrees with that of the type of *R. tongchouanensis* except that it reads "un peu buissonant" instead of "grim pant" and "fruits rouges" is omitted; the sheet in this herbarium contains three branches, one of them representing *R. niveus* and two *R. tongchouanensis*, the latter approaching *R. micranthus* in the glabrous branches and the slightly coarser serration, one of the leaves being 7-foliolate. It also resembles *R. foliolosus* D. Don and may be a form with mostly quinate leaves and somewhat larger leaflets.

Rubus coreanus Miquel in Ann. Mus. Bot. Lugd.-Bat. 3: 34 (Prol. Fl. Jap. 222) (1867). — Focke in Bibl. Bot. 17 (72^{II}): 184 (Spec. Rub.) (1911). — Nakai in Bot. Mag. Tokyo, 30: 226 (1916); Fl. Sylv. Kor. 7: 71, t. 29 (1918). — Cardot in Bull. Mus. Hist. Nat. Paris, 23: 302 (1917).

Rubus pseudosaxatilis Léveillé in Fedde, Rep. Spec. Nov. 5: 280 (1908); in Bull. Acad. Intern. Géog. Bot. 20 (Mém.): 72 (1909). — Focke in Bibl. Bot. 17 (72^{II}): 186 (Spec. Rub.) (1911).

Rubus pseudosaxatilis var. *Kouytchensis* Léveillé in Fedde, Rep. Spec. Nov. 5: 280 (1908); in Bull. Acad. Intern. Géog. Bot. 20 (Mém.): 72 (1909); Fl. Kouy-Tchéou, 358 (1915). — Focke in Bibl. Bot. 17 (72^{II}): 186 (Spec. Rub.) (1911).

Rubus quelpaertensis Léveillé in Fedde, Rep. Spec. Nov. 5: 280 (1908); in Bull. Acad. Intern. Géog. Bot. 20 (Mém.): 72 (1909). — Focke in Bibl. Bot. 17 (72^{II}): 186 (Spec. Rub.) (1911).

Rubus coreanus var. *Nakaianus* Léveillé in Fedde, Rep. Spec. Nov.

8: 358 (1910). — Focke in Bibl. Bot. 17 (72^{II}): 221 (1911); 19 (83): 44 (Spec. Rub. 268) (1914).

Rubus Hoatiensis Léveillé in Fedde, Rep. Spec. Nov. 11: 32 (1912). — Focke in Bibl. Bot. 19 (83): 44 (Spec. Rub. 268) (1914).

Rubus Nakaianus Lévl. in litt. fide Taquet ex Nakai in Bot. Mag. Tokyo, 30: 226 (1916), pro synonym. *R. coreani*.

KOREA. *Quelpaert*: *U. Faurie*, no. 1587, June 1907 (holotype of *R. pseudosaxatilis*; photo. in A. A.); in dumosis, *U. Faurie*, nos. 1584, 1585, June and July, 1907, "tarde flores et fructus emitit [*sic*], fructibus demum nigris" (syntypes of *R. quelpaertensis*; photo. in A. A.); in sylvis Hallaisan, 600 m., *E. Taquet*, nos. 2834, 2835, 2845 (syntypes of *R. coreanus* var. *Nakaianus*; isotypes in A. A.); Hoatien, *E. Taquet*, no. 5567, May 1911 (holotype of *R. Hoatiensis*; photo. in A. A.).

CHINA. *Kweichow*: Pin-fa, *J. Cavalerie*, no. 1256, May 3, 1902, "fl. roses-rouges" (holotype of *R. pseudosaxatilis* var. *Kouytchensis*; photo. in A. A.).

Rubus quelpaertensis and *R. pseudosaxatilis* were appended without comment to *R. coreanus* by Focke in 1911 and *R. Hoatiensis* was inserted after *R. opulifolius* Bertol. in 1914. By Nakai in 1916 and 1918 they were cited as synonyms of *R. coreanus*. Cardot mentions only *R. quelpaertensis* as a synonym of *R. coreanus*. *Rubus Hoatiensis* apparently represents a rather extreme form with all the leaves trifoliate except a single uppermost leaf which is simple and 3-lobed; it further differs in the large, in one branch paniculate inflorescence and in the aculeolate calyx, and may possibly represent a distinct variety.

The type specimens of *R. coreanus* var. *Nakaianus* are labeled in Léveillé's handwriting "*Rubus Nakaianus*."

Rubus parvifolius Linnaeus, Sp. Pl. 1197 (1753), excl. syn. cit. — Merrill in Trans. Am. Philos. Soc. n. ser., 24: 181 (Comm. Lour. Fl. Cochín.) (1935).

Rubus triphyllus Thunberg, Fl. Jap. 215 (1784). — Focke in Bibl. Bot. 17 (72^{II}): 187 (Spec. Rub.) (1911).

Rubus Taquetii Léveillé in Fedde, Rep. Spec. Nov. 7: 340 (1909). — **Synon. nov.**

Rubus triphyllus Thunb. var. *Taquetii* (Lévl.) Nakai in Bot. Mag. Tokyo, 30: 227 (1916); Fl. Sylv. Kor. 7: 74, t. 32 (1918).

KOREA. *Quelpaert*: in sepibus, 600 m., *E. Taquet*, no. 765, May 12, 1908 (holotype of *R. Taquetii*; isotype in A. A.).

Nakai keeps *R. Taquetii* as a distinct variety on account of its smaller leaves and the densely prickly inflorescence. He cites under his variety also Taquet's nos. 2832, 2834, 2844, 4223 and 4225, but of these only

no. 2832 has the inflorescence as prickly as Taquet no. 765. Focke does not mention *R. Taquetii* at all. According to a note on the type specimen Koidzumi identified it as *R. parvifolius* L. forma.

Rubus schizostylus Léveillé in Fedde, Rep. Spec. Nov. 5: 280 (1908). — Léveillé in Bull. Acad. Intern. Géog. Bot. 20 (Mém.): 83 (1909). — Focke in Bibl. Bot. 17 (72^{II}): 207, fig. 83 (Spec. Rub. 2) (1911). — Nakai, Fl. Kor. 2: 476 (1911); Fl. Sylv. Kor. 7: 72, t. 30 (1918). — Cardot in Bull. Mus. Hist. Nat. Paris, 23: 303 (1917).

KOREA. Q u e l p a e r t : *U. Faurie*, no. 1590, July 1907 (holotype; photo. in A. A.).

The plant figured by Nakai differs from the type in having part of the leaves 5-foliolate and the leaflets ovate to elliptic and acute, not suborbicular and rounded at the apex; the drawing is probably based on Faurie's no. 1586, cited by Cardot with the remark that it differs from the type in having almost all the leaves 5-foliolate and pubescent only on the veins beneath. Focke's figure represents a photograph of the type specimen.

Rubus illudens Léveillé in Fedde, Rep. Spec. Nov. 12: 283 (1913); Cat. Pl. Yun-Nan, 239 (1917). — Focke in Bibl. Bot. 19 (83): 264 (Spec. Rub. 488) (1914).

CHINA. Y u n n a n : vallées des montagnes derrière Tong-tchouan, alt. 2600 m., *E. E. Maire*, June, "fl. roses, fruits rouges" (holotype; photo. in A. A.).

Léveillé compares this species with *R. opulifolius* Bertol., but from that species it is readily distinguished by the glabrous branches, the ovate acuminate leaflets and the corymbose inflorescence. In the shape of the leaflets it resembles much *R. teledapos* Focke, but that species has a racemose inflorescence and partly 5-foliolate leaves. It is apparently nearest to *R. pedunculatus* D. Don, but differs in the glabrous slightly bloomy branches and in the more compact inflorescence, and much smaller flowers with the sepals about 4 mm. long. It might also be compared with *R. mesogaeus* Focke, but that species has pubescent branches, much larger leaves and white flowers.

Rubus foliolosus D. Don, Prodr. Fl. Nepal. 256 (1825). — Focke in Bibl. Bot. 17 (72^{II}): 191 (Spec. Rub.) (1911). — Léveillé, Cat. Pl. Yun-Nan, 239 (1917). — Handel-Mazzetti, Symb. Sin. 7: 505 (1933).

Rubus Bonatii Léveillé in Fedde, Rep. Spec. Nov. 7: 338 (1909).

Rubus Mairei Léveillé in Fedde, Rep. Spec. Nov. 12: 283 (1913); non Léveillé (1912). — Focke in Bibl. Bot. 19 (83): 263 (Spec. Rub. 487) (1914).

Rubus Boudieri Léveillé in Fedde, Rep. Spec. Nov. 12: 534 (1913); Cat. Pl. Yun-Nan, 236 (1917).

Rubus longistylus Léveillé in Fedde, Rep. Spec. Nov. 12: 534 (1913); Fl. Kouy-Tchéou, 359 (1915). — **Synon. nov.**

CHINA. K w e i c h o u : Chouang-chan-po, *J. Esquirol*, no. 3144, May 1911, "fl. blanche" (holotype of *R. longistylus*; photo. in A. A.). — Y u n n a n : without locality, "partout," *E. E. Maire*, March 1904, herb. Bonati no. 405 sub nom. *R. Mairei* (holotype of *R. Bonatii* in herb. Bonati; photo. in A. A.); plaine de Tong-tchouan, haies des tertres, alt. 2500 m., *E. E. Maire*, April [1912?], "fl. et fruits roses" (in herb. Léveillé sub *R. Bonatii*; photo. in A. A.); haies de la plaine à Tong-tchouan, *E. E. Maire*, May 1912, "fl. rouges, fruits jaunes" (holotype of *R. Mairei* (1913) and *R. Boudieri*; photo. in A. A.); haies, plaine de La-kou, alt. 2400 m., *E. E. Maire*, May, "fl. roses, fr. roses" (sub *R. Boudieri* in herb. Léveillé; photo. in A. A.).

Rubus Bonatii and *R. Boudieri* were first identified with *R. foliolosus* by Handel-Mazzetti in 1933. The only specimen agreeing in citation and description with the type of *R. Bonatii* is in herb. Bonati, now in herb. Univ. Calif., but it is labeled in Léveillé's handwriting *R. Mairei*, while the specimen labeled *R. Bonatii* by Léveillé in his herbarium is not cited with the description. On the label of the type of *R. longistylus* the color of the flowers is given as white, but the specimen is in young fruit and the color note may refer to the whitish tomentum of the fruits.

Rubus adenochlamys (Focke) Focke in Bibl. Bot. 17 (72^{II}): 191 (Spec. Rub.) (1911). — Cardot in Bull. Mus. Hist. Nat. Paris, 23: 303 (1917).

Rubus Kinashii var. *coreensis* Léveillé & Vaniot in Bull. Acad. Intern. Géog. Bot. 20 (Mém.): 80 (1909).

KOREA: no specimen cited.

Léveillé & Vaniot do not cite a specimen, but Cardot (l.c.) refers Faurie no. 1580 from Quelapaert to *R. adenochlamys*.

Rubus innominatus S. Moore var. ***Kuntzeanus*** (Hemsl.) Bailey, Gent. Herb. 1: 30 (1920).

Rubus Kuntzeanus Hemsley in Jour. Linn. Soc. Bot. 23: 232 (1887). — Focke in Bibl. Bot. 17 (72^{II}): 195 (Spec. Rub.) (1911). — Cardot in Bull. Mus. Hist. Nat. Paris, 23: 304 (1917).

Rubus xanthacantha Léveillé in Fedde, Rep. Spec. Nov. 4: 333 (1907). — Léveillé & Vaniot in Bull. Acad. Intern. Géog. Bot. 20 (Mém.): 99 (1909).

Rubus Kuntzeanus var. *xanthacantha* (Lévl.) Léveillé, Fl. Kouy-Tchéou, 360 (1915).

CHINA. K w e i c h o u : Pin-fa, *J. Cavalerie*, no. 2402, July 5,

1905, "fruits jaunes bons à manger" (holotype of *R. xanthacantha*; photo. in A. A.).

Rubus xanthacantha was first referred to *R. Kuntzeanus* by Focke in 1911 (l.c.). Léveillé four years later published it as a variety of that species. Cardot remarks that it differs from typical *R. Kuntzeanus* in the glandular calyx and forms a transition to his *R. Kuntzeanus* var. *glandulosus* (in Not. Syst. Paris, 3: 311. 1917). That variety is very close to typical *R. innominatus* S. Moore and differs only in the consistently three-foliolate leaves. Bailey (l.c.), however, states that the type specimen of Moore's species at herb. Kew shows only ternate leaves and proposes for the form with predominately five-foliolate leaves the name *R. innominatus* var. *quinatus*.

Rubus pinfaensis Léveillé & Vaniot in Bull. Soc. Agr. Sci. Arts Sarthe, 39: 320 (Bouquet Fl. Chine, 5) (1904); in Fedde, Rep. Spec. Nov. 6: 374 (1909). — Léveillé in Bull. Acad. Intern. Géog. Bot. 20 (Mém.): 106 (1909). — Focke in Bibl. Bot. 17 (72^{II}): 199, fig. 81 (1911); in Sargent, Pl. Wilson. 1: 55 (1911). — Léveillé, Fl. Kouy-Tchéou, 359 (1915). — Handel-Mazzetti, Symb. Sin. 7: 50 (1933).

Rubus fasciculatus Duthie in Ann. Bot. Gard. Calcutta, 9: 39, pl. 48 (1901). — Cardot in Bull. Mus. Hist. Nat. Paris, 23: 306 (1917). — Non P. J. Mueller (1858).

CHINA. K w e i c h o u : Pin-fa, route de Tou-chan, *J. Cavalerie*, no. 920, March 19, 1903 (holotype of *R. pinfaensis*; photo. in A. A.); environs de Kouy-yang, mont du Collège, *J. Chaffanjon*, no. 2057, Feb. 1898; grotte de Thong-thang, *J. Esquirol*, no. 2609, Feb. 25, 1911 (both cited in Fl. Kouy-Tchéou).

This is a well-marked species closely related to *R. ellipticus* Sm. It has been collected in Kweichou also by Y. Tsiang (nos. 5009 and 7794), by several collectors in Hupeh, Szechuan, Yunnan and northeastern Tibet; outside of China in the N.W. Himalaya, and according to Cardot in Formosa.

Rubus mesogaeus Focke in Bot. Jahrb. 29: 399 (1901); in Bibl. Bot. 17 (72^{II}): 204 (Spec. Rub.) (1911).

Rubus Kinashii Léveillé & Vaniot in Bull. Soc. Agr. Sci. Arts Sarthe, 40: 66 (1905); in Fedde, Rep. Spec. Nov. 2: 175 (1906); in Bull. Acad. Intern. Géog. Bot. 20 (Mém.): 80 (1909). — Focke in Bibl. Bot. 17 (72^{II}): 188, fig. 76 (Spec. Rub.) (1911). — Koidzumi in Jour. Coll. Sci. Tokyo, 34 (art. 2): 138 (1913). — Cardot in Bull. Mus. Hist. Nat. Paris, 23: 308 (1917). — **Synon. nov.**

Rubus eous Focke in Bibl. Bot. 17 (72^{II}): 204 (Spec. Rub.) (1911).

Rubus euleucus Focke ex Handel-Mazzetti, Symb. Sin. 7: 503 (1933), quoad syn. *R. Kinashii*.

JAPAN. H o n d o : Asama-yama, *U. Faurie*, no. 6072, July 1904 (holotype of *R. Kinashii*; photo. in A. A.).

Rubus Kinashii is placed by Focke in Ser. Nivei, but Cardot (l.c.) states that it is closely related to *R. mesogaesus* Focke, a species of Ser. Euidaei. After comparing copious material of both species, I have come to the conclusion that it is not only closely related, but identical with *R. mesogaesus*. I do not even find that the slight differences Cardot points out can be used to distinguish the Chinese and the Japanese plants. I agree with Koidzumi (l.c.) that *R. eous* is a synonym of *R. Kinashii* and consequently of *R. mesogaesus*.

Rubus kanayamensis Léveillé & Vaniot in Bull. Soc. Bot. France, 53: 549 (1906). — Léveillé in Bull. Acad. Intern. Géog. Bot. 20 (Mém.): 130 (1909). — Focke in Bibl. Bot. 17 (72^{II}): 205 (1911). — Cardot in Bull. Mus. Hist. Nat. Paris, 23: 309 (1917). — Makino & Tanaka, Man. Fl. Nippon, 253 (1927). — Makino & Nemoto, Nippon-shokubutsu-sôran, ed. 2, p. 515 (1931).

Rubus strigosus Michx. var. *kanayamensis* (Lévl. & Vant.) Koidzumi, Fl. Symb. Or.-As. 56 (1930).

JAPAN. H o k k a i d o : forêts de Kanayama, *U. Faurie*, no. 6688, July 1905 (holotype; isotype in A. A.).

According to Focke this species is nearest to *R. idaeus* var. *strigosus* (Michx.), but differs in the glabrous under side of the leaves and the looser inflorescence.

Rubus idaeus L. var. ***Yabei*** (Lévl. & Vant.) Koidzumi in Bot. Mag. Tokyo, 43: 389 (1929). — Makino & Nemoto, Nippon-shokubutsu-sôran, ed. 2, p. 515 (1931).

Rubus Yabei Léveillé & Vaniot in Bull. Soc. Agr. Arts Sarthe, 40: 65 (1905); in Fedde, Rep. Spec. Nov. 2: 275 (1906). — Léveillé in Bull. Acad. Intern. Géog. Bot. 20 (Mém.): 133 (1909). — Focke in Bibl. Bot. 17 (72^{II}): 210 (Spec. Rub.) (1911). — Koidzumi in Bot. Mag. Tokyo, 30: 78 (1916).

Rubus nipponicus (Focke) Koidzumi, Fl. Symb. Or.-As. 57 (1930), quoad syn. *R. Yabei*.

JAPAN. H o n d o : Jizogatake, *U. Faurie*, no. 5374, July 1903 (holotype; isotype in A. A.).

Rubus Yabei differs from *R. idaeus* var. *nipponicus* Focke in the sharply and doubly serrate leaves with acuminate mucronate teeth and a thin grayish white tomentum beneath, in the glabrous inflorescence with slender pedicels 1–1.5 cm. long and in the calyx being glabrous outside. *Faurie* no. 6685 mentioned by Cardot (in Bull. Mus. Hist. Nat. Paris, 23: 310. 1917) under *R. idaeus* is referable to this variety,

but differs in the mostly 5-foliolate leaves and in the pedicels and calyx outside being appressed pubescent; also the isotype in this herbarium of *R. Yabei* has the leaves mostly 5-foliolate, but otherwise agrees with the type of which there are two specimens in the herb. Lévillé.

***Rubus idaeus* L. var. *Matsumuranus* (Lévl. & Vant.) Koidzumi** in Jour. Coll. Sci. Tokyo, **34** (art. 2): 135 (Consp. Ros. Jap.) (1913), "subsp. *melanolasius* Focke & M." — Nakai in Bot. Mag. Tokyo, **30**: 229 (Praecurs. Fl. Sylv. Cor.) (1916). — Makino & Nemoto, Nippon-shokubutsu-sôran, ed. 2, p. 515 (1931).

Rubus strigosus Michx. ex Koidzumi, Fl. Symb. Or.-As. 55 (1930), quoad pl. japonicam.

Rubus Idaeus L. β *strigosus* (Michx.) Maximowicz in Bull. Acad. Sci. St. Pétersb. **17**: 161 (in Mém. Biol. **8**: 394) (1872), quoad pl. japonicam.

Rubus Matsumuranus Lévillé & Vaniot in Bull. Soc. Agr. Sci. Arts Sarthe, **40**: 66 (1905); in Fedde, Rep. Spec. Nov. **2**: 176 (1906); in Bull. Acad. Intern. Géog. Bot. **20** (Mém.): 131 (1909). — Focke in Bibl. Bot. **17** (72^{II}): 208 (Spec. Rub.) (1911).

JAPAN. H o n d o : in sylvis Ochiai, *U. Faurie*, no. 6071, Sept. 1904 (holotype of *R. Matsumuranus*; photo. in A. A.).

From *R. idaeus* var. *strigosus* to which it seems nearest, it differs in the densely puberulous stems and petioles, in the large simply serrate leaflets, the terminal one cordate or subcordate. This apparently represents the raspberry of Hondo and Hokkaido usually referred to *R. strigosus*; the latter probably does not occur in its typical form in Japan. From subsp. *nipponicus* Focke which it resembles in general aspect, var. *Matsumuranus* differs chiefly in the densely bristly and glandular-hirsute branches and inflorescences. To var. *Matsumuranus* belongs possibly *R. sachalinensis* var. *macrophyllus* Cardot (in Not. Syst. Herb. Mus. Paris, **3**: 315. 1917) based on *Faurie* no. 3122 which I have not seen.

***Rubus idaeus* var. *diamantinus* (Lévl.), comb. nov.**

Rubus diamantinus Lévillé in Fedde, Rep. Spec. Nov. **5**: 279 (1908); in Bull. Acad. Intern. Géog. Bot. **20** (Mém.): 77 (1909). — Focke in Bibl. Bot. **17** (72^{II}): 210 (Spec. Rub.) (1911). — Nakai in Jour. Coll. Sci. Tokyo, **31**: 476 (Fl. Kor. II) (1911), sphalmate "*diamanticus*." — Cardot in Bull. Mus. Hist. Nat. Paris, **23**: 311 (1917). — Koidzumi, Fl. Symb. Or.-As. 57 (1930).

Rubus idaeus var. *microphyllus* Turcz. ex Nakai in Bot. Mag. Tokyo, **30**: 228 (Praecurs. Fl. Sylv. Cor.) (1916); Fl. Sylv. Kor. **7**: 76 (1918), quoad syn. *R. diamantiacus*; vix Turczaninov.

KOREA. K o g e n d o p r o v. : in petrosis montis des diamants, 1000 m., rara, *U. Faurie*, no. 301, June 24, 1906 (holotype of *R. diamantinus*; photo. in A. A.).

Rubus diamantinus differs from the preceding and the following varieties chiefly in the small leaflets densely pubescent on the upper surface, otherwise it seems nearest to the following variety and may perhaps be referred to it as a form. Nakai referred *R. diamantinus* as a synonym to *R. idaeus* var. *microphyllus* Turczaninov in Bull. Soc. Nat. Moscou, 16: 682 (Fl. Baical.-Dahur. 1: 370) (1843), but var. *microphyllus* dates back to Wallroth, Sched. Crit. 226 (1822) and applies apparently to a low small-leaved European form of *R. idaeus* subsp. *vulgatus* Focke and not to a form related to subsp. *strigosus*.

Rubus idaeus var. **aculeatissimus** Regel & Tiling, Fl. Ajan. 87 (1858).

Rubus sachalinensis Léveillé in Fedde, Rep. Spec. Nov. 6: 332 (1909); in Bull. Acad. Intern. Géog. Bot. 20 (Mém.): 134 (1909). — Cardot in Bull. Mus. Hist. Nat. Paris, 23: 310 (1917). — **Synon. nov.**

Rubus idaeus subsp. *sachalinensis* (Lévl.) Focke in Bibl. Bot. 17 (72^{II}): 210 (Spec. Rub.) (1911). — Koidzumi in Jour. Coll. Sci. Tokyo, 34 (art. 2): 136 (1913). — Makino & Nemoto, Nippon-shokubutsu-sōran, ed. 2, p. 515 (1931). — Hulten in Svensk Vet. Akad. Handl. 8 (no. 1): 54, 188, map 499 (Fl. Kamtch.) (1929); (no. 2): 254 (1931).

Rubus melanolasius Focke var. *discolor* Komarov ex Miyabe & Miyake, Fl. Saghal. 129 (1915).

Rubus strigosus Michx. ex Koidzumi, Fl. Symb. Or.-As. 55 (1930), quoad syn. *R. sachalinensis*.

SAGHALIN: in silvis Korsakof, *U. Faurie*, nos. 565, 566, July 30, Sept. 30, 1908; in herbidis Vladimirof, no. 597, July 1908; in montibus Takinosawa, no. 567, July 24, 1908; without special locality, no. 598, pro parte, July 1908 (syntypes of *R. sachalinensis*; isotypes of 565, 566 and 567 and photo. of 598 in A. A.).

Focke already suggested the identity of *R. sachalinensis* with *R. idaeus* var. *aculeatissimus* by citing the latter name as a synonym of his *R. idaeus* subsp. *sachalinensis* attributing it to C. A. Mey. in herb.; he apparently was not aware that the name was published by Regel & Tiling in 1858 and should take precedence over his new combination. Also Cardot (l.c.) refers to this identification and Hulten (l.c. p. 55) remarks that the two are probably identical.

Faurie no. 598 which is cited above pro parte, has four branches on the type sheet; the two lower branches belong here, while the two upper branches, one with two immature flower buds, suggest *R. kanayamensis* on account of their glabrous leaves but the branches and petioles are very sparingly armed and the inflorescence is practically unarmed.

HERBARIUM, ARNOLD ARBORETUM,
HARVARD UNIVERSITY.

THE CHINESE SPECIES DESCRIBED IN MEYEN'S
"OBSERVATIONES BOTANICAE" (BEITRÄGE
ZUR BOTANIK)

E. D. MERRILL

PARTLY because certain Chinese species described in Meyen's "Observationes botanicae (Beiträge zur Botanik)" have been overlooked, partly because others have never been definitely placed, and partly because still others have been accepted as valid, although it is reasonably clear from their descriptions that they are but synonyms of other species, it has been thought expedient to make a somewhat critical study of them. The various Philippine species of flowering plants based on Meyen's collections have for the most part been disposed of in a satisfactory manner, either as valid species or as synonyms of previously described ones, as indicated in my "Enumeration of Philippine flowering plants." The status of these Philippine species was for the most part determined by an actual examination of their types in the Berlin Herbarium.

Meyen was primarily a plant physiologist. In 1830-32 he served as surgeon on the German ship "Prinzess Louise" on a trip around the world. Wherever stops were made he took advantage of the opportunity to collect botanical material. A detailed account of his journey was published in 1834-35.¹

In his published "Reise" Meyen included various observations on the vegetation of the countries visited, on individual species observed, and incidental to his narrative actually named and described a number of new plant species. Pages 292 to 400 of volume two of this work are devoted to his observations on China, as the result of his two stops in Kwangtung Province, August 15 to September 2, and November 11 to December 12, 1831. But a single new binomial appears in these pages, *Aralia trifoliata* Meyen, and this a *nomen nudum*; Walpers later placed it as a synonym of *Panax aculeatus* Ait. = *Acanthopanax trifoliatus* (Linn.) Merr.

The Chinese plants that Meyen collected and on which the descriptions discussed below were based, were secured mostly at Macao and on neighboring small islands, at Cape Syng-moon on Lantao Island, Hong-

¹Meyen, F. J. F. Reise um die Erde, ausgeführt auf dem Königlich Preussischen Seehandlungs-Schiffe Prinzess Louise, commandirt von Capitain W. Wendt, in den Jahren 1830, 1831 und 1832. 1: i-viii. 1-493. 1 t. 1 map, 1834; 2: i-vi. 1-411, 1 map, 1835.

kong New Territory, and Lintin Island, Canton River, near Hongkong. One of the new species was collected at Canton, and one on Lippas (Lappa) Island near Macao. From Meyen's own account of his journey it is safe to assume that the considerable number of his specimens that are cited merely as coming from "China" were collected at some one of the several localities listed above, and mostly at Macao, and on Lantao and Lintin Islands. These localities are all within a few miles of Hongkong. At the time of Meyen's visit, Hongkong Colony did not exist, Hongkong Island having been ceded to Great Britain in 1841, and the Colony chartered in 1843. The foreign commerce with southeastern China, up to the time of the establishment of Hongkong, was largely through the small Portuguese colony of Macao and with Canton.

The "Observationes botanicae"¹ is a composite work published after Meyen's death. The contributors were Ratzeburg, Grisebach, Klotzsch, Flotow, J. Meyen, Miquel, Nees von Esenbeck, Schauer, Vogel, and Walpers. In some cases Meyen is given as the joint author of certain species, notably in association with Nees von Esenbeck and with Walpers. In this work six new genera and about fifty new species of Chinese plants were characterized as new. It is with these new forms that I have concerned myself in the present paper. No attempt has been made to consider those records given in the form of previously described species, as usually no descriptive data are given. Apparently most of them were correctly named.

This study is based primarily on a critical examination of the descriptions in comparison with extensive collections of plants from Kwangtung Province. In some cases, as mentioned in the text, I am under obligations to Dr. J. Mattfeld of the Berlin Botanic Garden, who kindly searched for the types of certain species and made the necessary critical comparisons. In a very few cases the actual types could not be located, either because they have been lost or misplaced, or because the species represented has been transferred to some other genus without leaving a cross reference slip.

The references to Hemsley are to Forbes and Hemsley's "An enumeration of all the plants known from China proper . . ." *Jour. Linn. Soc. Bot.* 23: 1-521. *t.* 1-14. 1886-1888; 26: 1-592. *t.* 1-10. 1889-1902; 36: i-xi. 1-686. 1903-1905; those to Dunn and Tutchet to their "Flora of Kwangtung and Hongkong (China)." *Kew Bull. Add. Ser.* 10: 1-370, map. 1912.

¹Meyen, F. J. F. Beiträge zur Botanik gesammelt auf einer Reise um die Erde. Nach dessen Tode von den Mitgleidern der Akademie fortgeführt und bearbeitet. Observationes botanicae, in itinere circum terram institutae. Opus posthumum, sociorum academiae curis suppletum. *Nova Acta Acad. Leop.-Carol. Nat. Cur.* 19: Suppl. 1: i-xxxii. 1-512. *t.* 1-13. 1843.

One of the results of this study is the reduction to synonymy of about twelve species that Hemsley accepted, usually without comment, in his enumeration of Chinese plants. *Vernonia Gomphrena* Walp. = *Blumea obliqua* (Linn.) Druce, has not been found by any collector in China since Meyen secured it on Lintin Island in 1831; it seems likely that this was a casual introduction from India or Ceylon that may not have persisted. *Scleria pratensis* Lindl. = *S. pterota* Presl is to be excluded as a Chinese species, the Chinese record apparently having been based on an erroneously localized plant. *Ferula marathrophylla* Walp., very inadequately characterized, remains of entirely doubtful status, while *Aster Walpersianus* Nees cannot at present be associated with any other known Chinese species of the genus.

LICHENES

Ramalina digitata Meyen & Flotow, Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 212. t. 3. f. 1. 1843." Ad ramos Theae chinensis, tum in horto botanico Rio Janeiro urbis Brasiliae, tum in imperio Chinensi prope Canton."

Ramalina geniculata Hook. f. & Taylor, Lond. Jour. Bot. 3: 655. 1844; Zahlbr. Cat. Lich. Univ. 6: 490. 1930.

Zahlbruckner placed *Ramalina digitata* Meyen & Flotow as a doubtful synonym of *R. geniculata* Hook. f. & Tayl. J. Mueller, however, (Revisio Lichenum Meyenorum. Jahrb. Bot. Gart. Berlin 2: 310. 1883) on the basis of an examination of the Brazilian specimen (he did not see the Canton one) cites Nylander's recognition of it as related to *R. pumila* Mont. and states: "sed planta nihil nisi var. gracilis et tenuis divisa videtur ***Ramalinae geniculatae*** Hook. et Tayl." In view of Mueller's eminence as a lichenologist it is believed that this disposition of the species should be accepted. Most lichenologists accept *Ramalina geniculata* Hook. f. & Tayl., but *R. digitata* Meyen & Flotow is a valid name, and is one year older than that of Hooker f. & Taylor.

FUNGI

Fusarium Caries Nees, Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 478. 1843 "In spicis Meoschii lodicularis [*Ischaemum aristatum*] Chinae: Cap-Lintin."

Saccardo, Syll. Fung. 4: 725. 1886, merely lists this as a species of doubtful status unknown to him, erroneously crediting it to Chile. Wollenweber & Reinking, Die Fusarien 320. 1935, merely state: "non *Fusarium*." The problem of its identity is one for some mycologist to solve.

POLYPODIACEAE

Pteris ensiformis Burm. f. Fl. Ind. 230. 1768.

Pteris ensiformis Goldm. Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 457. 1843. "China" (syn. nov.).

Goldmann described this as a new species overlooking Burman's use of the same specific name for the same species. Christensen enumerated *Pteris ensiformis* Goldm. but suggested no reduction. An excellent photograph of Goldmann's type in the Berlin Herbarium, courteously supplied by Dr. Mattfeld, enables me to make this reduction with confidence as to its correctness. The type is a single fertile frond, a very few of the lower pinnules sterile. The rachis is not winged as in *P. multifida* Poir. and in *P. dimorpha* Copel. Philip. Jour. Sci. 3: Bot. 282. 1908; Ching, Ic. Fil. Sin. 1: 69. t. 34. 1930, the type of Copeland's species being from Kwangtung. Ching observes that *P. dimorpha* Copel. is more or less intermediate between *P. multifida* Poir. and *P. ensiformis* Burm. f.

LYCOPODIACEAE

Lycopodium cernuum Linn. Sp. Pl. 1103. 1763.

Lycopodium amentigerum Goldm. Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 468. 1843. "China" (syn. nov.).

From the short description this seems clearly to be a form of the widely distributed Linnaean species which is very common in Kwangtung Province. Goldmann's species was not accounted for by Spring in his "Monographie de la famille des Lycopodiacees" (1842-49), nor by Baker in his "Handbook of the fern-allies" (1877).

GRAMINEAE

Andropogon intermedius R. Br. var. **Haenkei** (Presl) Hackel in DC. Monog. Phan. 6: 486. 1889.

Andropogon Vachellii Nees in Hook. & Arn. Bot. Beechey Voy. 243. 1838; Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 188. 1843 "In vicinia urbis Macao imperii Chinensis et in insulis adiacentibus."

The description of 1838 is an ample one, but much of it is repeated in that of 1843. Hackel made the reduction of *A. Vachellii* Nees to *A. intermedius* R. Br. var. *Haenkei* (Presl) Hackel, but Rendle, Jour. Linn. Soc. Bot. 36: 373. 1904, recognized only R. Brown's species as occurring in China, not the variety.

Arundinella setosa Trin. Gram. Pan. 63. 1826; Keng, Nat. Centr. Univ. Sci. Rep. B 2: 56. 1936.

Miquelia barbulata Nees, Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 178. 1843 "In promontorio Syng-moon."

Berghausia barbulata Endl. in Miq. Analecta Bot. Ind. 2: 20. 1851.

Garnotia barbulata Merr. Philip. Jour. Sci. 13: Bot. 130. 1918; Hitchc. Lingnan Sci. Jour. 7: 200. 1931, quoad syn. Nees, excl. spec. cit.

In 1929, on the assumption that the current reduction of *Miquelia barbulata* Nees as a synonym of *Garnotia patula* Munro was correct, I transferred the former to *Garnotia*. In 1931 Hitchcock maintained *G. patula* Munro and *G. barbulata* Merr. as distinct species. Keng, in 1936, placed *Miquelia barbulata* Nees as a doubtful synonym of *Arundinella setosa* Trin., with *Berghausia barbulata* Endl. and *Garnotia barbulata* Nees as doubtful synonyms. Dr. Mattfeld reports that Meyen's type is not in the Berlin herbarium under *Garnotia*, and Dr. Pilger failed to locate it under *Arundinella*. Mrs. Chase states that *Levine 767*, which Hitchcock placed under *Garnotia barbulata* (Nees) Merr., is apparently a *Garnotia*, although Keng thought that it might be a young specimen of *Arundinella*. It agrees with Nees' description particularly in the prominent circles of hairs below the spikelets "pedicelli . . . pilis . . . infra spiculum in speciem involucelli congeruntur," yet Trinius gives this character of *A. setosa* Trin. thus: "pedicello sub spicula pilifero," and many specimens representing his species, particularly those with young spikelets, show this character. Nees also states that the inflorescences are dense and a foot long, its branches eight inches long. These characters scarcely apply to any Chinese *Garnotia*, but do apply to specimens of *Arundinella setosa* Trin. with immature inflorescences. It is suspected that Nees had an immature specimen of *Arundinella setosa* Trin., a very common species in the region whence Meyen's plant came, with strict erect inflorescence branches.

***Digitaria dispar* Henrard, Blumea 1: 97. 1934.**

Panicum (Digitaria) heteranthum Nees & Meyen, Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 174. 1843, non Link 1827 [China].

Digitaria heterantha Merr. Enum. Philip. Fl. Pl. 1: 53. 1923, Lingnan Agr. Rev. 1(2): 48. 1923.

Paspalum heteranthum Hook. f. Fl. Brit. Ind. 7: 16. 1927, quoad syn. Nees & Meyen.

Panicum commutatum Nees in Hook. & Arn. Bot. Beechey Voy. 251. 1836, non Schult. 1824, non *Digitaria commutata* Schult. 1824.

No definite locality was given, the species being enumerated under the heading "Chinenses." Rendle placed it as a synonym of *Digitaria barbata* Willd., he being followed by Miss Camus in her treatment of the grasses of Indochina; Hitchcock, Lingnan Sci. Jour. 7: 210. 1931,

placed it as a synonym of *Digitaria sanguinalis* (Linn.) Heist. Dr. Mattfeld kindly supplied me with a fragment of the Nees & Meyen type which I transmitted to Dr. Henrard, the synonymy, as given above, following the latter's manuscript treatment. He informs me that the species extends from southeastern China to Indochina and Pahang. The Philippine *D. heterantha* var. *pachyrachis* (Hack.) Merr. is *D. longissima* Mez.

Eragrostis pilosissima Link, Hort. Berol. 1: 189. 1827.

Eragrostis Millettii Hook. & Arn. Bot. Beechey Voy. 252. 1838; Nees, Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 206. 1843 "Ad Macao atque in insulis vicinis . . . ibidem in Promontorio Syng-moon."

The original description of Hooker & Arnott was based on specimens from Macao collected by Millett and by Vachell. Nees adds several synonyms in his consideration of the species in 1843. Link's species is a well-defined one not uncommon in southeastern China.

Eragrostis cylindrica (Roxb.) Nees in Hook. & Arn. Bot. Beechey Voy. 251. 1838.

Poa cylindrica Roxb. Fl. Ind. 1: 335. 1820, ed. 2, 1: 334. 1832.

Eragrostis geniculata Nees, Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 203. 1843 "In Promontorio Syng-moon."

Roxburgh's description of *Poa cylindrica* was based on specimens grown in the Calcutta Botanic Garden from Canton seeds. The species is common and widely distributed in southeastern China. *Eragrostis geniculata* Nees is safely the same as *E. cylindrica* (Roxb.) Nees.

Ischaemum aristatum Linn. subsp. **barbatum** (Retz.) Hackel var. **Meyenianum** (Nees) Hack. et var. **lodiculare** (Nees) Hack. in DC. Monog. Phan. 6: 205. 1889.

Meoschium Meyenianum Nees, Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 197. 1843 "Ad Promontorium Syng-moon."

Meoschium lodiculare Nees in Hook. & Arn. Bot. Beechey Voy. 246. 1838, Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 195. 1843. "In vicinia Macao urbis inque insulis adiectis . . . ad Promontorium Syng-moon."

The original description of 1838 is a particularly ample one, based on specimens collected by Meyen, Millett, and Vachell. While *Ischaemum aristatum* Linn. as currently interpreted is a somewhat variable, or perhaps a collective species, it may or may not be desirable to attempt to segregate subspecies and varieties. Rendle does not recognize the two varieties, reducing both of Nees' species to the subsp. *barbatum* Hack.

Pogonatherum paniceum (Lam.) Hackel, Allg. Bot. Zeitschr. 12: 178. 1906.

Saccharum paniceum Lam. Encycl. 1: 595. 1785.

Pogonatherum saccharoideum Beauv. Agrost. 176. t. 11. f. 7. 1812.

Pogonatherum refractum Nees, Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 182. 1843 "In imperio Chinensi ad Macao et in vicinis insulis . . . in diversis Indiae orientalis partibus."

This grass is common in Kwangtung Province and is of very wide geographic distribution in the Indo-Malaysian region. Hackel (DC. Monog. Phan. 6: 193. 1889) referred *Pogonatherum refractum* Nees to *P. saccharoideum* Beauv. var. *monandrum* (Roxb.) Hack.

Thysanolaena maxima (Roxb.) O. Ktze. Rev. Gen. Pl. 794. 1891.

Melica latifolia Roxb. Fl. Ind. 1: 330. 1820.

Panicum acariferum Trin. Ic. Gram. 1: t. 87. 1828. Mém. Acad. Sci. St. Pétersb. VI. Sci. Phys. Nat. 3: 293. 1834 (Panic. Gen. 205).

Thysanolaena Agrostis Nees, Edinb. New Philos. Jour. 18: 180. 1835.

Thysanolaena acarifera Arn. & Nees, Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 181. 1843 "In Promontorio Syng-moon."

Thysanolaena procera Mez, Bot. Arch. 1: 27. 1921, non *Agrostis procera* Retz.

The description by Arnott and Nees is an amplified one of this widely distributed, strongly characterized, Indo-Malaysian species. Nees enumerates the Indian *T. Agrostis* Nees as representing a distinct species but there seems to be no justification for this. *Agrostis procera* Retz. on which *Thysanolaena procera* Mez was based, is *Eriochloa procera* (Retz) Hubbard (*E. ramosa* O. Ktz.).

CYPERACEAE

Cladium chinense Nees, Linnaea 9: 301. 1834, *nomen nudum*, Hook. & Arn. Bot. Beechey Voy. 228. 1836, Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 116. 1843. "In China, circa Macao et in insulis adiacentibus."

Mariscus chinensis Fernald, Rhodora 25: 52. 1923.

Cladium jamaicense sensu C. B. Clarke, Jour. Linn. Soc. Bot. 36: 262. 1903, non Crantz.

Cladium japonicum Steud. Syn. Pl. Cyp. 152. 1855.

In 1923 Fernald adopted the generic name *Mariscus* (Haller) Zinn for this group and transferred a number of species from *Cladium* to *Mariscus*. In 1930 action by the Cambridge International Botanical Congress covered the points raised and settled the claims of *Cladium* B. Browne versus *Mariscus* (Haller) Zinn in favor of the former; see Sprague, Kew Bull. 217-219. 1934. *Cladium jamaicense* Crantz and

C. Mariscus Pohl have been interpreted in a collective sense as the names for a species of very wide geographic distribution. Fernald called attention to the fact that the European form, *Cladium Mariscus* (Linn.) Pohl (*Mariscus serratus* Gilib.) is distinct from the tropical one. He retained the tropical American species as *Mariscus jamaicensis* Britton = *Cladium jamaicense* Crantz, and separated the Chinese form as a third species. As Nees originally noted the achenes of *Cladium chinense* Nees are much smaller than in the European form, and Fernald states further that its pale achenes are but about one-third as large as are those of *Mariscus serratus* Gilib. = *Cladium Mariscus* Pohl, and that they are ellipsoid-ovoid and very short tipped rather than lance-ovoid and acuminate.

***Cyperus compressus* Linn. Sp. Pl. 46. 1753.**

Cyperus Meyenii Nees & Walp. Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 57. 1843. "In Manila insula . . . in China, etc."

This is the common pantropic *Cyperus compressus* Linn. Kükenthal (Pflanzenr. 101 (IV.20): 158. 1935) places *C. Meyenii* Nees & Walp. as a synonym of *C. compressus* Linn. var. *pectiniformis* (Roem. & Schultes) C. B. Clarke, giving its range as India, Indochina, Java, Philippines and Mexico.

***Cyperus radians* Nees & Meyen, Linnaea 9: 285. 1834, *nomen nudum*, Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 63. 1843. "Ad Promontorium Syng-moon imperii Chinensis."**

Cyperus radicans Nees & Meyen ex Kunth, Enum. 2: 95. 1837, err. typ.

Cyperus Griffithii Steud. Syn. 2: 316. 1855.

Cyperus sinensis Debeaux, Act. Soc. Linn. Bordeaux 31: t. 2. 1877, 32: 28. 1878.

This is a strongly marked, well-known species. Technically the first published description is as *Cyperus radicans*, but in 1837, when Kunth published this binomial, he credited it to "Nees ab Esenb. et Meyen in Linnaea 9. 285 (v. s.)", and Nees & Meyen's printed *nomen nudum* in Linnaea is *C. radians*. I do not think that this can be interpreted as other than a typographical error; otherwise Kunth's non-descriptive name will replace the distinctly descriptive one of Nees & Meyen.

***Fimbristylis subbispicata* Nees & Meyen, Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 75. 1843. "Habitat ad Macao urbem, in vicinis insulis et in Promontorio Syng-moon imperii Chinensis."**

As noted by Clarke, Jour. Linn. Soc. Bot. 36: 246. 1903, the limits

and relationships of this species are not entirely clear. In Wight's Contributions (1834), and in the Botany of Captain Beechey's Voyage (1836) Nees confused this with *F. bispicata* Nees & Meyen. It is believed that the status of the binomial *F. subbispicata* Nees & Meyen should be settled on the basis of the Macao and Syng-moon plants cited in the description of 1843.

***Fimbristylis sericea* R. Br. Prodr. 228. 1810.**

Fimbristylis decora Nees & Meyen in Wight, Contrib. Bot. Ind. 101. 1834. Hook. & Arn. Bot. Beechey Voy. 225. 1836, Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 83. 1843. "In China, Julio a. 1831, Ibidem, in Herb. Lindl."

The original description of 1834 was based on Meyen's specimen and one collected by Potts, probably at Macao. The species as interpreted by Clarke is one of wide geographic distribution occurring along the seashore from India to Japan southward to Australia. Other synonyms are *Fimbristylis velutina* Franch. and *Scirpus sericeus* Poir.

***Fimbristylis podocarpa* Nees & Meyen in Wight, Contrib. Bot. Ind. 98. 1834, Hook. & Arn. Bot. Beechey Voy. 225. 1836, Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 77. 1843, pro parte, quoad var. α . "Crescit var. α in China, (Meyen)."**

In the original description in Wight's Contributions, and in the Nova Acta description, the localities cited are China, Manila, India and Himalaya, three varieties being characterized. As species are now segregated in this critical group more than one is represented in Nees & Meyen's concept, including *F. diphylla* Vahl, fide C. B. Clarke, and *F. podocarpa* Nees & Meyen. I believe under the circumstances that the species should be interpreted by the first specimen cited, and this is the Meyen specimen under variety α . Clarke's procedure in maintaining Hooker f. as the authority of the binomial *Fimbristylis podocarpa* is inadmissible under any rules; it should be *F. podocarpa* Nees & Meyen or Nees & Meyen in part.

***Lepidosperma chinense* Nees & Meyen, Linnaea 9: 302. 1834, *nomen nudum*. Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 117. 1843. "China, ad promontorium Syng-moon . . . in vicinia Macao urbis insulisque adiacentibus . . . in Lippas insula."**

A well-known species common in Kwangtung Province. The Macao and Lappa Island specimens were collected by Vachell.

***Rhynchospora chinensis* Nees & Meyen, Linnaea 9: 297. 1834, *nomen nudum*, Wight, Contrib. Bot. Ind. 115. 1834, Hook. & Arn. Bot.**

Beechey Voy. 226. 1836, Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 108. 1843. "In China, ad Promontorium Syng-moon . . . Meyen; in Nepalia Wallich" and in the previous line "Wall. Cat. n. 3421, Vachell in Herb. Lindl. n. 60."

Clarke's note on this species, Jour. Linn. Soc. Bot. 36: 259. 1903, sub *Rhynchospora glauca* Vahl var. *chinensis* Clarke, should be consulted. I agree with Dr. Mattfeld that Nees & Meyen, not Boeckeler is the authority, Clarke accepting the latter. I can do no better than quote Dr. Mattfeld's statement: "*Rhynchospora chinensis* Nees et Meyen. — Das Original wurde in unserm Herbar von C. B. Clarke als *Rh. glauca* Vahl var. *chinensis* spec. Boeck. bestimmt. — Wallich no. 3421 bestimmte Clarke als typische *Rh. glauca*. — Wallich's Pflanze wird von Nees nur als Synonym zitiert. Die nomenklatorische und systematische Grundlage für *Rh. chinensis* ist also immer Meyen's Pflanze, an die der Name geknüpft bleiben muss, auch wenn die nicht ganz einheitliche *Rh. chinensis* Nees aufgeteilt wird. Nimmt man diese Sippe als Art so wäre zu zitieren: *Rh. chinensis* Nees et Meyen emend. Boeckeler; als Varietät: *Rh. glauca* Vahl var. *chinensis* (N. et M. ex parte) C. B. Cl. — Auch Kükenthal fasst die *chinensis* als Varietät von *glauca* auf. — Wallich's Pflanze wurde von Boeckeler zuerst als *Rh. Brownii* bezeichnet; diesen Namen zog er später aber, wie aus einer handschriftlichen Eintragung in dem Handexemplar seiner Monographie hervorgeht, als Synonym zu *Rh. glauca*. — Kunth zog Wallich's und Meyen's Pflanzen zu *Rh. laxa* R. Br., die er aber schon für "nil nisi forma indica R. glaucae" hielt. — Nees und Kunth hielten also die asiatische Sippe für einheitlich. Boeckeler erkannte zuerst die Unterschiede; die eine Komponente erkannte er als identisch mit der amerikanischen *glauca*; die zweite hielt er für eine besondere Art *chinensis* (Typus Meyen), die Clarke dann zur Varietät von *glauca* reduzierte." Whether we are dealing with a distinct species or with a variety is a matter of some difference of opinion. The type of *Rh. glauca* Vahl is an American plant.

Scleria pterota Presl, Oken Isis 21: 268. 1826; Core, Brittonia 2: 91. t. 2. f. 18. 1936.

Scleria pratensis Lindl. ex Nees, Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 121. 1843. "var. α , in China, ad prom. Syng-moon, Julio 1831, Meyen; Bahiae . . . Guiana . . ."

Lindley's species is a synonym of *S. pterota* Presl. The Chinese record was apparently based on an erroneously localized specimen. Core cites about fifteen synonyms for the species which is widely distributed in tropical America.

COMMELINACEAE

Commelina diffusa Burm. f. Fl. Ind. 18. t. 7. f. 2. 1768.

Commelina nudiflora sensu Burm. f. op. cit. 17 et auct plur., non Linn.

Commelina longicaulis Jacq. Coll. 3: 234. 1789, Ic. Pl. Rar. 2: t. 294. 1786-93; Pennell, Bull. Torr. Bot. Club 43: 100. 1916.

Commelina pacifica Vahl, Enum. 2: 168. 1806.

Commelina cespitosa Roxb. Fl. Ind. 1: 178. 1820, ed. 2, 1: 174. 1833.

Commelina ochreate Schauer, Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 447. 1843. "China: Lintin, Octobri; Macao, Augusto."

N. E. Brown, following C. B. Clarke, placed Schauer's species as a synonym of *Commelina nudiflora* Linn.; it is that species as currently interpreted but not the species that Linnaeus described, except as *Commelina nudiflora* Linn., as originally published, included more than one species. It should be noted that *Commelina nudiflora* Linn., currently accepted as such, is also the name-bringing synonym of *Aneilema nudiflorum* (Linn.) "R. Br." An analysis of the original Linnaean description by Mr. J. E. Dandy of the British Museum, shows that the specimens in Linnaeus' herbarium, three sheets, at least one of which was there in 1753, all represent *Aneilema nudiflorum*; that the Flora Zeylanica reference is a *Commelina*, and the form currently known as *C. nudiflora* Linn.; and that the Plukenet reference may represent the same form as the Flora Zeylanica one. There is no actual *new description* in the Species Plantarum, except as the cited Flora Zeylanica reference is modified by the addition of the words "involucro nullo." Mr. Dandy considers this to be a very significant modification, since the phrase "involucro nullo" actually applies to the material in Linnaeus' herbarium and not to the Hermann and Plukenet plants, while the specific name *nudiflora* was clearly selected because it was descriptive of the actual specimens Linnaeus had before him. The actual specimen numbered by Linnaeus as "7 nudiflora" was one collected by Osbeck (either in Java or in the vicinity of Canton), and this should, we believe, be designated as the type; it is the *Aneilema*. If further confirmation of the correctness of this interpretation be needed, the greatly amplified description of *Commelina nudiflora* Linn. Mant. 2: 177. 1771 appertains entirely to the *Aneilema*, not to the *Commelina nudiflora* of modern authors. I believe that it is clear just what Linnaeus intended even although he referred certain pre-Linnaean items to the binomial in 1753 which represent a different species.

As I have already noted elsewhere¹ Osbeck did not return to Sweden

¹Merrill, E. D. On *Poa malabarica* Linnaeus. Bull. Torr. Bot. Club 60: 633-638. 1933.

until June 26, 1752. Manifestly at that time the copy for the Species Plantarum must have been well advanced. It is possible that Linnaeus' original concept of *Commelina nudiflora* may have been based on the Flora Zeylanica and the Plukenet references. When he received Osbeck's specimens he selected the descriptive name *nudiflora* and modified the Flora Zeylanica descriptive sentence accordingly. Osbeck cites but two species of *Commelina*, *C. communis* and *C. chinensis*, both collected by him on Dane's Island, near Whampoa, China, October 20, 1751. See Merrill, E. D. "Osbeck's Dagbok öfwer en Ostindsk resa" Am. Jour. Bot. 3: 571-588. 1916.

The oldest valid name for this form seems to be *Commelina diffusa* Burm. f. Pennell, Bull. Torr. Bot. Club 43: 100. 1916, adopted *Commelina longicaulis* Jacq. (1788) as the proper binomial for this widely distributed pantropic species, considering that *Commelina diffusa* Burm. f. was unidentifiable. Burman's description is short, and his illustration is distinctly poor. Dr. Hochreutiner informs me that the only specimen of *Commelina diffusa* Burm. f. in Burman's herbarium was examined by Clarke, and was indicated by the latter as Burman's type; it is "*C. nudiflora*" as named by Clarke. He notes, however, that there is a question mark after the name *C. diffusa*, and that this was apparently added by Burman. He states that it is difficult to explain why Burman should apply the name *diffusa* to this specimen when at the same time he applied the name *C. nudiflora* Linn. to another specimen that manifestly represents the same species. Burman's rather crude figure represents a *Commelina* very similar to what is currently known as *C. nudiflora* Linn., and there seems to be no valid reason why his binomial should not be accepted.

I had noted, some years ago, this anomalous disposition of the binomial *Commelina nudiflora* Linn., first as a valid species of *Commelina*, and second as the name-bringing synonym of *Aneilema nudiflorum* "R. Br." Assuming that Clarke was correct in his interpretation of the Linnaean species as a true *Commelina*, I further assumed that *Commelina nudiflora* Linn. as redescribed in 1771 was different from the *C. nudiflora* Linn. of 1753. For this reason I adopted the binomial *Aneilema malabaricum* (Linn.) Merr. for the *Aneilema*. With the above interpretation of the type of *Commelina nudiflora* Linn. the partial synonymy of this, as an *Aneilema*, is as follows:

Aneilema nudiflorum (Linn.) Wall. List. 182. no. 5224. 1830; Kunth, Enum. 4: 66. 1843; Clarke in DC. Monog. Phan. 3: 210. 1881; Pennell, Bull. Torr. Bot. Club 43: 96. 407. 1916.

Commelina nudiflora Linn. Sp. Pl. 41. 1753, pro parte, excl. syn. et ref. Fl. Zeyl. et Plukenet; Mant. 1: 177. 1767.

Tradescantia malabarica Linn. Sp. Pl. ed. 2, 412. 1762.

Commelina nudicaulis Burm. f. Fl. Ind. 17, t. 8, f. 1. 1768.

Aneilema nudicaule Kunth, Enum. 4: 67. 1843.

Commelina trichocolea Schauer, Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 448. 1843.

Aneilema malabaricum Merr. Philip. Jour. Sci. 7: Bot. 232. 1912, Fl. Manila 138. 1912, Enum. Philip. Fl. Pl. 1: 196. 1923.

The usual authority cited for *Aneilema nudiflorum* is R. Brown, but Brown, Prodr. 271. 1810, did not publish such a binomial, merely indicating that *Commelina nudiflora* Linn. was an *Aneilema*. Pennell accepted Kunth as the authority. Wallich published an *Aneilema nudiflorum* in 1830, based, however, on *Commelina nudiflora* herb. Roxb.; Roxburgh merely accepted the Linnaean binomial, and did not independently describe it as a "new species." His description of *Commelina nudiflora* Linn., Fl. Ind. 1: 177. 1820, is of the Linnaean species as it has been interpreted in this discussion, i.e. the *Aneilema*, and he cites *Tradescantia malabarica* Linn. as a synonym. Under the circumstances it is believed that Wallich should be accepted as the authority.

ORCHIDACEAE

Arundina chinensis Blume, Bijdr. 402. 1825; Schltr. Repert. Sp. Nov. Beih. 4: 204. 1919.

Cymbidium Meyenii Schauer, Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 433. 1843. "China: Macao."

Arundina Meyenii Reichb. f. Linnaea 25: 227. 1852.

Rolfe's reduction seems safely to be the correct disposition of *Cymbidium Meyenii* Schauer. Blume's type was from a plant originating in China, cultivated at Buitenzorg, Java.

Cymbidium ensifolium (Linn.) Sw. Nova Acta Acad. Soc. Sci. Upsal. II 6: 77. 1799; Schltr. Repert. Sp. Nov. Beih. 4: 266. 1919.

Epidendrum ensifolium Linn. Sp. Pl. 954. 1753.

Cymbidium micans Schauer, Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 433. 1843. "China: Macao."

This is Rolfe's reduction, it being apparently correct. The type of the Linnaean species was a specimen collected by Osbeck near Canton.

Habenaria linguella Lindl. Gen. Sp. Orch. Pl. 325. 1835; Merr. Sunyatsenia 1: 13. t. 4, f. 2. 1930.

Habenaria acuífera sensu Rolfe, Jour. Linn. Soc. Bot. 36: 57. 1903. non Wall.

Habenaria endotherix Miq. Jour. Bot. Néerl. 1: 92. 1861.

Centrochilus gracilis Schauer, Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 435. t. 13, f. B. 1843. "China: Promontorium Syng-moon."

Schauer described this as the type of a new genus. It was not accounted for by Rolfe in his treatment of the Orchidaceae of China in Forbes and Hemsley's Enumeration, by Dunn and Tutcher, nor by Schlechter in his Orch. Sino-Jap. Prodr. (Repert. Sp. Nov. Beih. 4: 1-319. 1919). It seems clearly to be the same as *Habenaria linguella* Lindl., type from Kwangtung Province (probably from Macao), from which it seems to be manifest that *Habenaria endotherix* Miq., type from Hoan, a short distance north of Hongkong, is not to be distinguished.

***Habenaria Meyenii*, nom. nov.**

Choeradoplectron spiranthes Schauer, Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 436. t. 13. f. C. 1843. "China: Promontorio Syng-moon," non *Habenaria spiranthes* Reichb. f., nec Reichb. f. & Warming.

Peristylus chloranthus Lindl. Hook. Jour. Bot. Kew Gard. Miscel. 7: 37. 1855, non *Habenaria chlorantha* Spreng., nec Bab.

Habenaria lacertifera Benth. Fl. Hongkong. 362. 1861, non *Coeloglossum lacertiferum* Lindl.

Rolfe, in placing Schauer's species (described by Schauer as the type of a new genus) as a synonym of *Peristylus chloranthus* Lindl. (type from Hongkong), interpreted the Chinese form as representing the same species as the Indian form described by Lindley as *Coeloglossum lacertiferum* Lindl. and as *C. acuminatum* Lindl. Schlechter, however, states that this is apparently not the case. The Chinese plant belongs in *Peristylus*, a group placed by some botanists under *Platyanthera*, by others under *Habenaria*. The type of *Coeloglossum acuminatum* Lindl. was from Nepal and the Indian material that I have seen is distinctly unlike this Chinese species. The type of *C. lacertiferum* Lindl. was from Tavoy, and this seems much closer to the Chinese form than *C. acuminatum* Lindl.

RANUNCULACEAE

Clematis Meyeniana Walp. Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 297. 1843. "China: Cap Syng-Moon"; Sprague, Kew Bull. 46. 1916.

A well-known species common in southeastern China, extending to Indochina, Formosa and northern Luzon.

MENISPERMACEAE

Cyclea hypoglauca (Schauer) Diels, Pflanzenr. 46 (IV. 94): 319. 1910.

Cissampelos hypoglauca Schauer, Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 479. 1843. "China: Cap Syng-moon."
Cyclea deltoidea Miers, Jour. Bot. Kew Gard. Miscel. 3: 258. 1851.

Hemsley overlooked Schauer's species and thus failed to account for it. The type of *C. deltoidea* Miers was from Hongkong. The species is a fairly common one in Kwangtung Province.

LEGUMINOSAE

***Bauhinia variegata* Linn. Sp. Pl. 375. 1753.**

Bauhinia chinensis Vogel, Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 42. 1843. "Circa Canton Chinae culta."

From Vogel's description I see no reason for doubting the correctness of this reduction. The species is not native of China, but is not uncommon in cultivation in Kwangtung Province.

***Clitoria ternatea* Linn. Sp. Pl. 753. 1753.**

Wisteria dubia Walp. Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 324. 1843. "China: absque loco" (syn. nov.).

Walpers had only fragmentary material with a single detached flower. Hemsley admitted the species without comment, but Dunn and Tutcher did not account for it, although its type must have been from the general vicinity of Hongkong. Doctor Mattfeld informs me that Walpers' type in the Berlin Herbarium represents *Clitoria ternatea* Linn., the determination by Dr. Harms.

***Crotalaria albida* Heyne ex Roth, Nov. Pl. Sp. 333. 1821.**

Crotalaria leiocarpos Vogel, Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 8. 1843 (syn. nov.). "In Promontorio Syng-moon Chinae."

Vogel's species was admitted by Hemsley without comment, but it was not accounted for by Dunn and Tutcher. The species extends from India to southeastern China, Formosa, Indochina, Malay Peninsula and the Philippines. Vogel's description conforms with the characters of Heyne's species.

***Crotalaria elliptica* Roxb. Fl. Ind. ed. 2, 3: 279. 1832.**

Crotalaria Vachellii Hook. & Arn. Bot. Beechey Voy. 180. 1833.

Crotalaria splendens Vogel, Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 8. 1843. "China."

This reduction of Vogel's species is apparently correct. Roxburgh's type was a specimen cultivated at Calcutta from seeds originating in China, and probably from the vicinity of Macao or of Canton; the type of *C. Vachellii* Hook. & Arn. was from Canton. The species is a rather common one in Kwangtung Province.

Desmodium heterocarpum (Linn.) DC. Prodr. 2: 337. 1825.

Hedysarum heterocarpon Linn. Sp. Pl. 747. 1753.

Hedysarum polycarpon Poir. in Lam. Encycl. 6: 413. 1804.

Desmodium polycarpum DC. Prodr. 2: 334. 1825.

Desmodium nervosum Vogel, Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 28. 1843. "China."

Schindler, Repert. Sp. Nov. Beih. 49: 85, 285. 1928, placed Vogel's species as a synonym of *Desmodium siliquosum* Burm. f. In my discussion of Loureiro's species, Trans. Am. Philos. Soc. II 24(2): 200. 1935, the problem of *Desmodium siliquosum* (Burm. f.) DC. versus *D. heterocarpum* (Linn.) DC. is extensively discussed. For the present, at least, it seems desirable to retain the Linnaean binomial for this Chinese form; Hemsley reduced Vogel's species to *D. polycarpum* DC.

Eriosema chinense Vogel, Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 31. 1843. "China."

A characteristic, well-known, widely distributed, Indo-Malaysian species, for which Vogel's name is the oldest valid one. It is *Dolichos biflorus* sensu Lour. (1790), non Linn. Other synonyms are *Crotalaria tuberosa* Ham. and *Pyrrothotrichia tuberosa* Wight & Arn.

Lespedeza formosa (Vogel) Koehne, Deutsch. Dendrol. 343. 1893; Schindler, Repert. Sp. Nov. Beih. 49: 85. 164. 1928.

Desmodium formosum Vogel, Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 29. 1843. "In pratis circa Macao, Chinae."

Lespedeza viatorum Champ. Hook. Jour. Bot. Kew Gard. Miscel. 4: 47. 1852.

This was admitted by Hemsley as *Desmodium formosum* Vogel with a statement that he had seen no Chinese material of *Desmodium* conforming to Vogel's description. It was not accounted for by Dunn and Tutcher. It is, however, clearly the same as *Lespedeza viatorum* Champ. as described in 1852, this species being correctly reduced to *Lespedeza formosa* (Vogel) Koehne, by Schindler. This is not *L. penduliflora* (Oudem.) Nakai, Bot. Mag. Tokyo 37: 79. 1923, although Nakai cites *L. formosa* Koehne as a synonym; Koehne's binomial was based on Vogel's and thus *Lespedeza formosa* (Vogel) Koehne appertains to this species of southern China, in spite of the fact that Koehne applied the name to the more northern *L. penduliflora* (Oudem.) Nakai = *L. Thunbergii* Nakai, and erroneously cited as synonyms *L. racemosa* S. & Z. and *L. Sieboldii* Miq.

Lespedeza sericea (Thunb.) Miq. Ann. Mus. Bot. Lugd.-Bat. 3: 49. 1867.

Hedysarum sericeum Thunb. Fl. Jap. 287 (err. typ. 289). 1784; Schindler, Sargent Pl. Wils. 2: 105. 1914.

Indigofera chinensis Vogel, Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 14. 1843. "Circa Macao in imperio Chinensi."

Vogel's species was admitted by Hemsley as a valid one of *Indigofera*, without comment. It was not accounted for by Dunn and Tutcher. Schindler's reduction of it to *Lespedeza sericea* (Thunb.) Miq. is undoubtedly correct. Most of the material from southern China is erroneously referred to *Lespedeza juncea* Pers.

Millettia nitida Benth. Hook. Lond. Jour. Bot. 1: 484. 1842; Dunn, Jour. Linn. Soc. Bot. 41: 161. 1912.

Marquartia tomentosa Vogel, Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 35. t. 1. 1843. "In fruticetis promontorii Syng-moon Chinae."

Callerya tomentosa Endl. ex Jackson, Ind. Kew. 1: 385. 1893.

Dunn states that *Millettia nitida* Benth. is unknown from outside of Hongkong Island. His distinction between this species and the closely allied *Millettia Dielsiana* Harms is by no means convincing. It is suspected that most of the Kwangtung material currently referred to *Millettia Dielsiana* Harms (1900) really represents *M. nitida* Benth. *Callerya* was proposed by Endlicher as a new generic name for *Marquartia* Vogel, *M. tomentosa* Vogel being originally described as the type of a new genus. Endlicher published no binomial (Gen. Suppl. 3: 104. 1843), this apparently appearing first in Index Kewensis.

Pycnospora lutescens (Poir.) Schindl. Jour. Bot. 64: 145. 1926.

Hedysarum lutescens Poir. in Lam. Encycl. 6: 417. 1804.

Desmodium viride Vogel, Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 29. 1843. "In pratis circa Macao, Chinae."

Meibomia viridis O. Ktz. Rev. Gen. Pl. 198. 1891.

Poiret's type of *Hedysarum lutescens* was from the vicinity of Canton. Vogel's species was admitted by Hemsley as a valid species of *Desmodium*, without comment. It was not mentioned by Dunn and Tutcher. Schindler's reduction of it to the common and widely distributed *Pycnospora lutescens* (Poir.) Schindl. is unquestionably correct. Other synonyms are *Pycnospora nervosa* W. & A., *Crotalaria ? nervosa* Wall., *Zornia lutescens* Steud., *Phyllodium lutescens* Desv., *Meibomia lutescens* O. Ktz., *Flemingia monosperma* Moon, *Pycnospora hedysaroides* R. Br., *Indigofera desmodioides* Benth., and *Crotalaria Tappenbeckiana* K. Schum. It is usually known as *Pycnospora hedysarioides* R. Br. It is common in Kwangtung Province and extends from India to Formosa southward through Malaysia to tropical Australia.

Tephrosia vestita Vogel, Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 15. 1843. "In promontorio Syng-Moon Chinae."

A well-known strongly marked species extending from southeastern China to Java and New Guinea.

VITACEAE

Ampelopsis cantoniensis (Hook. & Arn.) Planch. in DC. Monog. Phan. 5: 460. 1887.

Cissus cantoniensis Hook. & Arn. Bot. Beechey Voy. 175. 1833.

Vitis cantoniensis Seem. Bot. Voy. Herald 370. 1857.

Cissus diversifolia Walp. Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 314. 1843. "China: Cap Syng-moon."

Hedera hypoglauca Hance, Walp. Ann. 2: 724. 1852.

This is the synonymy as given by Planchon, it apparently being correct. The species is common in Kwangtung Province.

MALVACEAE

Urena lobata Linn. Sp. Pl. 692. 1753.

Urena diversifolia Walp. Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 305. 1843. "China: Macao."

This seems clearly to be only a form of the very common and variable *Urena lobata* Linn. to which it was reduced by Hemsley.

MYRTACEAE

Eugenia microphylla Abel, Narr. Jour. China 181. 364. 1818; Forbes, Jour. Bot. 22: 124. 1884.

Syzygium ? *buxifolium* Hook. & Arn. Bot. Beechey Voy. 187. 1833.

Syllisium buxifolium Meyen & Schauer, Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 334. 1843. "China: Macao."

Eugenia sinensis Hemsl. Jour. Linn. Soc. Bot. 23: 298. 1887.

Meyen and Schauer described this as the type of a new genus with no reference to the earlier *Syzygium* ? *buxifolium* Hook. & Arn., the type of the latter also from Macao or in its general vicinity. The species is common and widely distributed in southeastern China.

ARALIACEAE

Acanthopanax trifoliatum (Linn.) Merr. Philip. Jour. Sci. 1: Suppl. 217. 1906; Schneider, Ill. Handb. Laubholz. 2: 427. 1909.

Zanthoxylum trifoliatum Linn. Sp. Pl. 270. 1753.

Panax aculeatum Ait. Hort. Kew. 3: 448. 1789.

Acanthopanax aculeatum Seem. Jour. Bot. 5: 238. 1867.

Aralia trifoliata Meyen, Reise 2: 332. 1835 [China], *nomen nudum*.

This is the only new binomial that I have detected in Meyen's own account of his visit to China in 1831 (*Reise um die Erde . . . in den Jahren 1830, 1831, und 1832*. 2: 292–400. 1835). There is no description but Walpers (*Nova Acta Acad. Leop.-Carol. Nat. Cur.* 19: Suppl. 1: 348. 1843) and K. Koch. (*Wochenschr. Gärtn. Pflanzenk.* 2: 366. 1859) examined Meyen's specimen in the Berlin Herbarium and reduced *Aralia trifoliata* Meyen to *Panax aculeatum* Ait.

UMBELLIFERAE

Ferula marathrophylla Walp. *Nova Acta Acad. Leop.-Carol. Nat. Cur.* 19: Suppl. 1: 347. 1843. "China: Cap Syng-moon."

This is admitted by Hemsley as the only *Ferula* known from China, and by Dunn and Tutchet without comment. Doctor Mattfeld reports that there is no specimen in the Berlin Herbarium under *Ferula*, representing this species. Because of the description of the leaf segments as "lineari-capillaceis" I suggested search in those genera known to have representatives in Kwangtung Province having slender leaf segments but Meyen's specimen could not be found under *Apium*, *Foeniculum* and *Coriandrum*. There is the possibility that the Meyen specimen was erroneously localized, or again the record may have been based on an introduced plant that perhaps has not persisted. I cannot place the species on the basis of the rather short description.

LOGANIACEAE

Mitrasacme nudicaulis Reinw. ex Blume, *Bijdr.* 849. 1826.

Mitrasacme chinensis Griseb. *Nova Acta Acad. Leop.-Carol. Nat. Cur.* 19: Suppl. 1: 51. 1843. "Locus natalis Cap Syng-moon Chinae."

The Chinese form does not appear to be specifically distinct from the Javan one as originally described by Reinwardt. It is therefore believed that the current reduction of Grisebach's species as a synonym of *M. nudicaulis* Reinw. is correct. The species is one of wide geographic distribution in the Indo-Malaysian region.

ASCLEPIADACEAE

Toxocarpus Wightianus Hook. & Arn. *Bot. Beechey Voy.* 200. 1836.

Schistocodon Meyenii Schauer, *Nova Acta Acad. Leop.-Carol. Nat. Cur.* 19: Suppl. 1: 363. 1843. "China: Promont. Syng-moon."

Here described as the type of a new genus, but manifestly the same as *Toxocarpus Wightianus* Hook. & Arn., the type of the latter from Macao or in its immediate vicinity. The species is common in Kwangtung Province.

LENTIBULARIACEAE

Utricularia racemosa, Wall. List, no. 1496. 1829, *nomen nudum*; Walp. Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 401. 1843. "China: Cap Syng-moon"; DC. Prodr. 8: 21. 1844.

Walpers' description is one year earlier than is that of deCandolle. It was apparently based on both Wallich 1496 and on Meyen's Syng-moon specimen.

SCROPHULARIACEAE

Adenosma glutinosum (Linn.) Druce, Bot. Exch. Club Brit. Isles Rep. 3: 413. 1914; Merr. Philip. Jour. Sci. 12: Bot. 109. 1917.

Gerardia glutinosa Linn. Sp. Pl. 611. 1753; Osbeck, Dagbok Ostind. Resa 229. t. 9. 1757.

Digitalis sinensis Lour. Fl. Cochinch. 478. 1790.

Pterostigma grandiflorum Benth. Scroph. Ind. 21. 1835; Hook. & Arn. Bot. Beechey Voy. 204. t. 45. 1836.

Adenosma grandiflorum Benth. ex Hance, Jour. Linn. Soc. Bot. 13: 114. 1872.

Pterostigma rubiginosum Walp. Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 393. 1843. "China: Macao."

The Linnaean type was a specimen collected by Osbeck in the vicinity of Canton; it was illustrated by Osbeck four years after it was originally characterized. The types of all the species above listed as synonyms were from the neighborhood of Macao or of Canton, where the plant is still common.

Lindernia crustacea (Linn.) F. Muell. Census 97. 1882.

Capraria crustacea Linn. Mant. 1: 87. 1767.

Vandellia crustacea Benth. Scroph. Ind. 35. 1835.

Vandellia limosa Walp. Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 394. 1843. "China: in limosis prope Lintin"; Hemsl. Jour. Linn. Soc. Bot. 26: 190. 1890.

Hemsley admits this as a valid species but quotes Benthham who suggested that it might be the same as *Vandellia crustacea* Benth. It was not accounted for by Dunn and Tutcher. From the short description I could see no reason for distinguishing it from the very common *Lindernia crustacea* (Linn.) F. Muell. (*Vandellia crustacea* Benth.) and Dr. Mattfeld confirms this by an examination of the type specimen in Berlin.

RUBIACEAE

Oldenlandia corymbosa Linn. Sp. Pl. 119. 1753.

Scoparia gypsophiloides Walp. Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 394. 1843. "China: Lintin" (syn. nov.).

Doctor Mattfeld reports that no specimen representing this species is to be found in the Berlin herbarium under *Scoparia*. On the basis of the short description, this works out as *Oldenlandia corymbosa* Linn., the only Kwangtung species known in any family that conforms to the characters indicated by Walpers. The above reduction is made with considerable confidence that it is correct. *Oldenlandia corymbosa* Linn. is a very common weed in Kwangtung Province, and is now of pantropic distribution. Hemsley merely listed the species, in brackets, as a Chinese plant unknown to him, realizing that no *Scoparia* was represented. Fries, in his "Systematische Übersicht der Gattung *Scoparia*." Arkiv Bot. 6(9): 1-31. t. 1-8. 1907, places it among the *species dubiae* and merely states: "Ist mit aller Wahrscheinlichkeit keine *Scoparia*."

COMPOSITAE

Aster panduratus Nees, Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 258. 1843. "China: Lintin"; Hemsl. Jour. Linn. Soc. Bot. 23: 415. 1888; Dunn & Tutcher, Kew Bull. Add. Ser. 10: 141. 1912.

Aster Fordii Hemsl. Jour. Linn. Soc. Bot. 23: 410. 1888; Dunn & Tutcher, l.c. (syn. nov.).

Hemsley admitted Nees' species without comment. Dunn and Tutcher distinguished *A. Fordii* Hemsl. and *A. panduratus* Nees (having seen no specimens representing the latter) as follows: "Upper leaves entire, obtuse, *A. Fordii*"; "Upper leaves serrate, acuminate, *A. panduratus*." Doctor Mattfeld examined Nees' type in the Berlin Herbarium and states that it represents the same species as *Hongkong herb. 2824*, distributed as *A. Fordii* Hemsl. The leaves of Nees' species are mostly entire, some with 1 to 3 small teeth in the upper one-third. Some of the leaves are blunt and mucronate, others somewhat acute.

Aster Walpersianus Nees, Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 259. 1843. "China: Lintin."

Hemsley admits this species without comment, but Dunn and Tutcher do not include it. Doctor Mattfeld reports that the type specimen consists only of a small twig, that, however, agrees with Nees' description although the label bears the statement "Macao, in convallibus montium inferiorum" not Lintin as stated in the description. The heads are hemispheric. The specimen does not conform to the characters of any of the species of *Aster* credited by Dunn and Tutcher to Kwangtung Province. It is somewhat similar to those forms of the North American *Aster laevis* Linn. that also bear larger leaves on the lateral branches. From the data at present available I am unable to associate this species with any other described species of the genus from China.

Blumea hieracifolia (D. Don) DC. in Wight, Contrib. Bot. Ind. 15. 1834, Prodr. 5: 442. 1836.

Erigeron hieracifolium D. Don, Prodr. Fl. Nepal. 172. 1825.

Blumea chinensis Walp. Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 294, 1843. "China: Cap Syng-moon" (sub *Vernonia conyzoides* DC. p. 254), non DC. 1834.

Walpers first referred the specimen to *Vernonia conyzoides* DC., but in the *addenda* characterized it as a new species of *Blumea*, overlooking the fact that deCandolle had already applied the specific name *chinensis* to a very different species. In Index Kewensis it is reduced to *Blumea hieracifolia* DC., the species to which Walpers compared it, and Hemsley states that it is perhaps a form of *B. hieracifolia* DC. Dunn and Tutcher do not mention it, although they admit deCandolle's species as growing in Kwangtung Province. There is a portion of the type specimen in the Klatt collection at the Gray Herbarium labeled "*Blumea chinensis* Walp. China-Cap Syng-moon" and this seems safely to represent the same species as the Chinese material referred by Hemsley and by Dunn and Tutcher to *B. hieracifolia* DC.; the label bears also an unpublished binomial accredited to Dietrich. The Chinese specimens, however, are by no means identical with the Indian material on which deCandolle's species was originally based, but may still represent *Blumea hieracifolia* (D. Don) DC. sensu latiore.

Blumea obliqua (Linn.) Druce, Bot. Exch. Club Brit. Isles Rep. 4: 609. 1917.

Erigeron obliquum Linn. Mant. 2: 573. 1771.

Conyza obliqua Willd. Sp. Pl. 3: 1930. 1804.

Conyza amplexicaulis Lam. Encycl. 2: 84. 1786.

Blumea amplexens DC. in Wight, Contrib. Bot. Ind. 13. 1834. Prodr. 5: 433. 1836.

Vernonia Gomphrena Walp. Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 253. 1843. "China: Lintin" (syn. nov.).

Hemsley admitted this as *Vernonia Gomphrena* Walp., without comment other than the slightly erroneous statement that it was from China "without locality"; Dunn and Tutcher did not account for it. Doctor Mattfeld states that Walpers' type specimen in the Berlin herbarium bears also an unpublished binomial, sub *Blumea*, proposed by Schulz-Bipontinus. He further states that it is very similar to, if not identical with, the Indian *Blumea amplexens* DC. There is an excellent sketch of Walpers' type, with fragments (a leaf and immature heads), in the Klatt collection now at the Gray Herbarium. On the basis of the data and information now available I believe that *Vernonia Gomphrena* Walp. is but a form of the Indian and Ceylon *Blumea obliqua* (Linn.) Druce (*B. amplexens* DC.), in spite of the fact that the species is not repre-

sented by any modern collections from Kwangtung. Because of the very extensive early commerce between India and Macao and Canton, it is entirely possible that here we have an introduced plant that perhaps has not persisted. Gagnepain does not admit the Linnaean species for the Indochina flora, neither does Craib record it from Siam. In attempting possibly to connect *Vernonia Gomphrena* Walp. with some one of the Indochina species of *Blumea* all of Gagnepain's descriptions were scanned; at first it was thought that possibly *Blumea hongkongensis* Vaniot might be the one sought. However Vaniot's original description does not at all apply to Walpers' species, while the Indo-China plant that Gagnepain described (Lecomte Fl. Gén. Indo-Chine 3: 531. 1924) under Vaniot's binomial apparently does not represent the same species that Vaniot had. The original description calls for a plant with petioled leaves attenuate below into a long cuneate base; while Gagnepain described a plant with sessile and somewhat stem-clasping leaves, citing only specimens from Indochina and Siam; Vaniot's type was from Hongkong. *Blumea obliqua* (Linn.) Druce, except for this Lintin Island record for China, is known from Central India, the western Peninsula, Bengal and Ceylon, and as interpreted by Hooker f. is distinctly a collective species. The type of *Vernonia Gomphrena* Walp. closely approximates specimens of *Blumea amplexans* DC. from Madras and Ceylon.

Glossogyne tenuifolia (Labill.) Cass. Dict. Sci. Nat. 51: 475. 1827.

Bidens tenuifolia Labill. Sert. Austr. Caled. 44. t. 45. 1824-25.

Bidens Meyeniana Walp. Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 271. 1843. "China: Cap Syng-moon" (syn. nov.).

Hemsley admitted *Bidens Meyeniana* Walp. as a valid species, stating that it might be referable to *B. parviflora* Willd. or *B. pinnata* Linn. It is not accounted for by Dunn and Tutcher. Cassini's species is common in southeastern China. Walpers' description conforms to its characters, and from the description alone *Bidens Meyeniana* Walp. is safely referable to *Glossogyne tenuifolia* Cass. This disposition of it is confirmed by Sherff's reference of Meyen's type in the Berlin Herbarium to Cassini's species.

Inula Cappa (Ham.) DC. Prodr. 5: 469. 1836.

Conyza Cappa Ham. in D. Don, Prodr. Fl. Nepal. 176. 1825.

Inula pseudo-cappa DC. l.c.

Duhaldea chinensis DC. op. cit. 366.

Vernonia congesta Benth. Hook. Lond. Jour. Bot. 1: 487. 1842.

Vernonia eriosematoides Walp. Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 254. 1843. "China: Cap Syng-moon."

Moquinia eriosematoides Walp. Repert. 6: 317. 1846-47.

Hamilton's original description was based on Indian material. The other binomials listed above were all based on Chinese specimens. As *Inula Cappa* DC. is currently interpreted this seems to be the correct disposition of Walpers' species.

Microglossa pyrifolia (Lam.) O. Ktze. Rev. Gen. Pl. 353. 1891; Merr. Lingnan Sci. Jour. 15: 428. 1936.

Conyza pyrifolia Lam. Encycl. 2: 89. 1786.

Conyza volubilis Wall. List no. 3057. 1831, *nomen nudum*.

Microglossa volubilis DC. Prodr. 5: 320. 1836.

Conyza syringaefolia Meyen & Walp. Nova Acta Acad. Leop.-Carol. Nat. Cur. 19: Suppl. 1: 263. 1843. "China: Cap Syng-moon. Insula Zbar."; Hemsley Jour. Linn. Soc. Bot. 23: 420. 1888.

Conyza syringaefolia Meyen & Walp. was admitted by Hemsley who states that in many respects the description agrees with *Microglossa volubilis* DC. It was not accounted for by Dunn and Tutcher. An examination of the type by Dr. Mattfeld shows that it is the same as *Microglossa volubilis* (Wall.) DC. = *M. pyrifolia* (Lam.) O. Ktze. This is verified by an excellent sketch of Meyen and Walpers' type, together with a fragment of it in the Klatt collection now in the Gray Herbarium. The species is common and is widely distributed in the Indo-Malaysian region.

ARNOLD ARBORETUM,
HARVARD UNIVERSITY.

